Gustafson & Triebel

Economical Design Of a Short Span Fink Trussed Roof

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THE ECONOMICAL DESIGN OF A SHORT SPAN FINK TRUSSED ROOF

BY

JOHN C. GUSTAFSON

AND

ALBERT TRIEBEL

THESIS FOR THE DEGREE OF BACHELOR OF SCIENCE
IN ARCHITECTURAL ENGINEERING

COLLEGE OF ENGINEERING

UNIVERSITY OF ILLINOIS

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THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

JOHN CHRISTOPHER GUSTAFSON and ALBERT TRIEBEL

ENTITLED THE ECONOMICAL DESIGN OF A SHORT SPAN FINK TRUSSED ROOF

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE

OF Bachelor of Science in Architectural Engineering

N. Clifford Ricker

HEAD OF DEPARTMENT OF Architecture

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The Economical Design of a Short Span Fink Truss Roof.

In the beginning, when we undertook to investigate the economy of roof trusses it was our intention to study not only the economy in the design and spacing of the Fink truss, but of several other types as well. The magnitude of the problem has proven too great, however, for the limited space of time at our command, and, therefore, we found it necessary to limit ourselves to the Fink type alone. This was chosen because it was considered as being the most common type of truss in use today, and hence the results obtained would be of the most practical value.

The span of 50'-0" was kept constant throughout the investigation. A spacing of ten feet centers was first assumed, and increased by two feet six inches each time until a spacing of twenty five feet had been obtained. The rise was then increased to twelve and one half feet, the spacing beginning, as before, at ten feet centers and increasing by two

and one half feet until twenty five feet had been obtained. The rise was then increased by increments of two and one half feet until a rise of twenty two and one half feet had been reached. Thus, in all, forty two trusses have been investigated.

In designing the trusses no section has been used less than $2\frac{1}{2}" \times 2" \times \frac{1}{4}"$ angles, this being the least section which can be used with $\frac{3}{4}"$ rivets. The minimum thickness in all cases was taken as $\frac{1}{4}"$; for gusset and splice plates a thickness of $\frac{1}{2}"$ was maintained, thus lessening the size of the plates and the number of rivets used in the connections. In figuring the details only three trusses in each rise have been carefully and completely detailed, namely 10'-0" - 14'-6" and 25'-0" centers. From the percentage of details thus established an average was found, and the weights thus computed. The weight of the truss was assumed according to the formula as given by Merriman and Jacoby,

$W = \frac{3}{4} AL\left(1 + \frac{L}{10}\right)$ where

A = distance centre to centre of trusses

L = span of truss in feet.

upon this assumption - the actual weight of the truss has been computed; and then with the actual weight of the truss thus found the stresses for dead and snow loads have been revised and the sections again designed.

The stresses were found by the method of graphic statics; the maximum stress consisting of a full dead load, plus a snow load of 20 lbs. per square foot upon the horizontal projection, plus a wind load of 30 lbs. per square foot upon the vertical, acting upon one side of the roof only.

The sections have been designed for the following unit stresses:-

Tension, 8 tons per square inch net section.

Compression, $8.00 - .42\frac{L}{r}$ tons per square inch, where L = length of member in feet

r = least radius of gyration in inches.

In order to apply this formula readily and easily a graphical table has been made, a copy of which is incorporated in this report.

Rivets have been computed upon

-the basis of

Shear = 7500 lbs. per sq. in.

Bearing = 15000 " " " ".

All rivets were 3/4" diameter.

The sheathing, rafters, and purlins have been compiled by formulae which have been simplified, and very kindly given us by Dean Ricker.

"The following formulae are derived from those found in Merriman and Jacoby's work, with the following changes to reduce them to their simplest forms".

Let F = safe fibre stress in tons per sq. in.

= 8.00 tons for steel

E = modulus of elasticity in tons.

= 14000 tons for steel.

L = length of beam in feet.

Steel Purlins.

These were designed for both breaking ($\frac{F}{c}$) and for bending (I), the safest result being used in each case. The formulae here given are for ends supported and purlin loaded uniformly for the entire length.

$\frac{F}{c} = \frac{3wL}{16}$ = section modulus - breaking formula

$I = \frac{3wL^2}{50}$ = moment of inertia - bending "

where w = total load upon purlin in tons.

The purlin may yield either normally or parallel to the roof surface; and hence its resistance must be sufficient in each direction, or it must be supported at intermediate points by suspension rods extending parallel to roof plane to the ridge purlin.

Let V = total permanent and snow load in tons.

N = " wind load upon purlin " "

Then $W' = V \cos i + N$ = total load acting normal to the roof surface and

$W'' = V \sin i$ = total load parallel to the roof surface. "i" is the angle of inclination. These formulas are applied to both cases of bending (I) and breaking ($\frac{I}{c}$), and purlin made safe in both directions.

be found, however, that in all cases such an excess of section was required for loads parallel to the roof surface over that necessary for loads normal to the roof surface, that it was best to take up the stress parallel to the roof by means of rods. These rods were used in all cases. In order to determine the maximum distance required between supports, considering the rod as a support, the following formula was used, both

for bending and breaking as before, the safest result being used.

For safe resistance to breaking $L = \sqrt[2]{\frac{16F}{3we}}$

" " " " bending $L = \sqrt[3]{\frac{56F}{3w}}$

Rafters.

"Stresses in the rafter are evidently of two kinds beside shear:-

1st "Compression lengthwise increasing to a maximum at the lower end.

2nd Uniformly distributed transverse loading acting normal to the roof surface and length of the rafter.

There are two methods of determining the action of the rafter:-

a The accurate method, considering both longitudinal and transverse loading.

b. The approximate method, considering transverse loading only."

By transverse loading in this latter method we mean the direct sum of the dead and snow loads acting vertically and the wind load acting normally to the roof surface. Thus it will be noticed that the word transverse loading is used in different senses in the two methods. The latter method

has been used in this investigation; it usually gives a section a little larger than the accurate method, but it is safe and much more ~~convient~~ convenient and rapid.

$W = V + N$ = transverse bending

$\frac{I}{c} = \frac{WL^2c}{128000}$ = section modulus

$I = \frac{WL^3c}{448000}$ = moment of inertia

The ~~sole~~ value governed the section in each instance. The value "c" is the distance of outer centre to centre in inches.

The process of obtaining the result being the same for each truss it seems hardly necessary to give in full the itemized data for more than one truss. The truss selected is the first one in the series, namely 50'-0" span, 10'-0" rise, 10'-0" centres. We shall, however, give the stresses, sections, revised stresses and sections for all the trusses in the investigation.

Computations.

50'-0" span 10'-0" Rise 10'-0" Centers.

$i = 21°-55'$ N.W.P. = 14.55# @ V = 30# S.P. = 20# Hor.

Panel length = 6.73 ft. Panel area = 67.3 Sq. ft.

$\cos i = .928$ $\sin i = .372$

Roof covering:-

Sheathing, h.h. pine ⅞" = 4.00 # per sq. ft.

slate = 10.00 # " " "

felt 0.50 # " " "

snow = 20 × .9 × 8 = 18.56 # " " "

Total load upon roof surface = 33.00 # " " "

Total load perpendicular to roof surface =

33.00 × .9 × 8 + 14.55 = 45.18 # per sq. ft.

To find maximum distance centre to centre of rafters

For breaking, $L = \sqrt{\frac{5600 f^{-v}}{3W}} = \sqrt{\frac{5600 \times .875}{3 \times 45.18}} = 5.63$ ft.

" bending. $L = \sqrt[3]{\frac{17000 f^3}{3W}} = \sqrt[3]{\frac{17000 \times .875}{3 \times 45.18}} = 4.38$ ft.

Rafters:-

To be of steel with nailing pieces upon which to fasten the roof covering.

Rafters to be spaced 30" centers.

For breaking $\frac{I}{c} = \frac{WL^2 C}{18000}$

" bending $I = \frac{WL^3 C}{448000}$

V = total dead and snow load in lbs. per sq. ft. of roof surface

N = normal wind pressure in lbs. per sq. ft.

$W = V + n = 33 + 14.55 = 47.55$ lbs.

s = distance in inches c. to c. of rafters

L = length in feet of rafters.

Hence $\frac{F}{e} = \frac{47.55 \times 6.73^2 \times 30}{128000} = .504$

$I = \frac{47.55 \times 6.73^3 \times 30}{448000} = .970$ } 3"-4# [

Purlins - Uniformly loaded.

Load upon purlin:-

V = total dead + snow load in tons = $\frac{67.3 \times 33}{2000} = 1.110$

N = " wind load in tons = $\frac{67.3 \times 14.5}{2000} = .490$

$W' = V\cos i + N$ = total load normal to roof = 1.52 tons

$W'' = V \sin i$ = " " parallel " " = .413 "

For load normal to roof:-

for bending $\frac{F}{e} = \frac{3WL}{16} = \frac{3 \times 1.52 \times 10}{16} = 2.84$

" bending $I = \frac{3WL^2}{56} = \frac{3 \times 1.52 \times 100}{56} = 8.14$ } 5"-9 3/4# I

For loads parallel to roof:-

for bending $\frac{F}{e} = \frac{3WL}{16} = \frac{3 \times .413 \times 10}{16} = .774$

" bending $I = \frac{3WL^2}{56} = \frac{3 \times .413 \times 100}{56} = 2.210$ } 7"-17 1/2# or 8"-18# I

We shall use a 5"-9 3/4# beam with rods to take up the stress parallel to the roof surface.

To determine the distance between supports, considering the rods as a support:-

For bending -

$L = \sqrt{\frac{16F}{3We}} = \sqrt{\frac{16 \times 1.5 \times 3}{3 \times .0413 \times 1.5}} = 9.18$ feet

For bending.—

$$L = \sqrt[3]{\frac{56I}{3W}} = \sqrt[3]{\frac{56 \times 1.23}{3 \times .0413}} = 5.56 \text{ ft.}$$

Hence we may safely use one rod in the middle of the span, it bearing, but less feet.

Stress in rod = .413 tons. Rod = $\frac{1}{2}$" diam upset.

" " " = .826 " " " = $\frac{1}{2}$" " "

" " " = 1.239 " " " = $\frac{1}{2}$" " "

" " " = 1.652 " " " = $\frac{9}{16}$" " "

Apex Purlin.

Dead + Snow load = 1.110 tons

N. wind " = 0.490 "

Vertical wind load = 0.455 " = .490 × .928

" " " upon purlin = .228 tons

Total vertical load upon purlin =

1.110 + .228 = 1.338 tons.

$$\frac{I}{c} = \frac{3WL}{16} = \frac{3 \times 1.338 \times 10}{16} = 2.50$$

$$I = \frac{3WL^2}{56} = \frac{3 \times 1.338 \times 100}{56} = 7.15$$

It is not necessary to consider the stress due to the supporting rods. We shall consider only the vertical component of this stress, considering that the horizontal forces, or components, counterbalance each other.

$$V = 1.652 \times .372 \text{ (sin i)} = .615 \text{ tons}$$

This load is concentrated at the centre of the beam and hence these formulae are to be used:-

$$\frac{I}{c} = \frac{3WL}{8} = \frac{3 \times .615 \times 10}{8} = 2.30$$

$$I = \frac{3WL^2}{35} = \frac{3 \times .615 \times 100}{35} = 5.27$$

The total values of I and $\frac{I}{c}$ required for the apex purlin are therefore,

$I = 7.15 + 5.27 = 12.42$
$\frac{I}{c} = 2.5 + 2.3 = 4.80$
} 6"-12¼ * beam.

Joint loads.

Dead load:-

Roof surface = 64.3 × 14.5 = 975.9
purlin = 5"-9¾* × 10' = 94.5
4 rafters = 3"-4* @ 6.75' = 107.7
nailing pcs = 32.5
nods = 12.5
bars = 281.5
total dead load = 1507.6 # = .754 tons
Snow load = 64.3 × 18.56 = 1250 # = .625 "
Wind " = 64.3 × 14.55 = 980 # = .490 "
Total dead + Snow loads = = 1.379 "

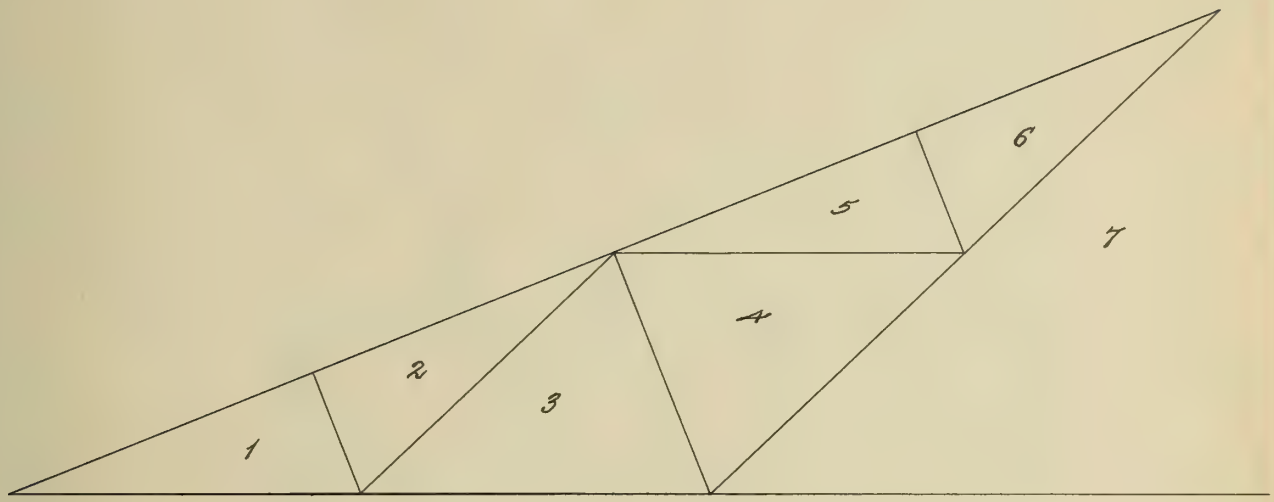
loads upon one half truss:-

Dead + Snow =

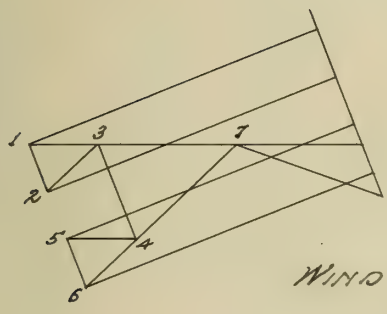
1.379 × 3.5 = 4.82 tons

Wind =

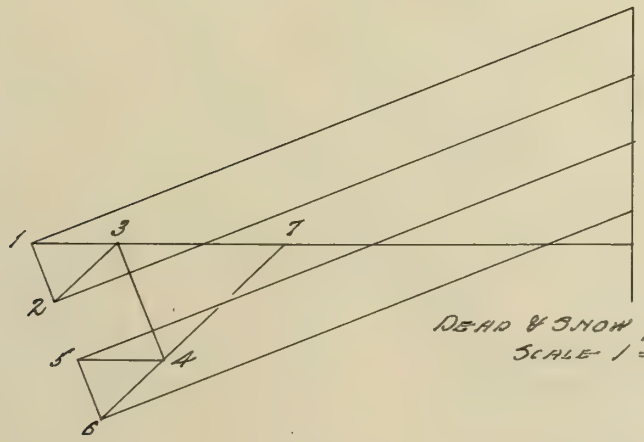
.490 × 3.5 = 1.72 "



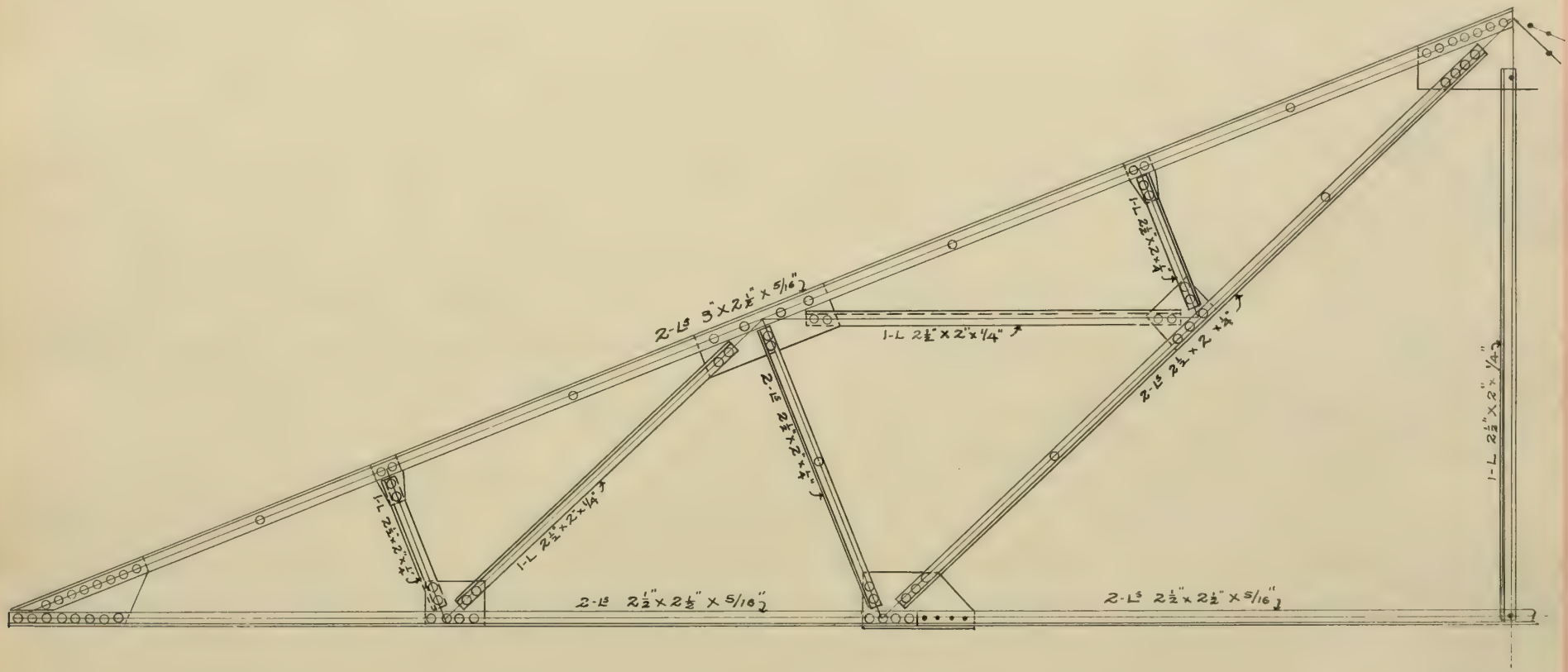
50'-0" SPAN-
10'-0" RISE 10'-0" CENTRES.



WIND LOAD
SCALE 1"=2 TONS.



DEAD & SNOW LOADS.
SCALE 1" = 4 TONS.



50'-0" SPAN.
10'-0" RISE 10'-0" CENTRES.

Span 50'-0" Rise 10'-0" Distance centre to centre 10'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	2.92	1.44	13.00		+ 15.92	6.73	2 - 3 × 2½ × 5/16	11.2		
B–2	"		12.50		+ 15.42	"	"	"		
C–5	"		12.00		+ 14.92	"	"	"		
D–6	"		11.50		+ 14.42	"	"	"	580.61	
1–2	.50		1.30		+ 1.80	3.00	1 - 2½ × 2 × ¼	3.7	22.20	
2–3	.68		1.73		- 2.11	7.25	1 - "	"	53.65	
3–4	1.00		2.60		+ 3.60	5.38	2 - "	7.4	79.62	
4–5	.68		1.73		- 2.11	7.25	1 - "	3.7	53.65	
5–6	.50		1.30		+ 1.80	3.00	2 - "	7.4	22.20	
6–7	2.04		5.20		- 7.24	7.25	1 - "	3.7	107.30	
4–7	1.38		3.50		- 4.88	"	2 - "	7.4	107.30	
X–1	3.12		12.10		- 15.22	"	2 - 2½ × 2½ × 5/16	10.0		
X–3	2.48		10.38		- 12.86	"	"	"		
X–7	1.12		6.90		- 8.02	21.00	"	"	500.00	
Tie 7–7							1 - 2½ × 2 × ¼	3.7	32.08	
									1558.61	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				15.32						
B–2				14.85						
C–5				14.30						
D–6	Total 233.79			13.82	No Changes					Final Cal.
1–2				1.74						1558.61
2–3				2.03						233.79
3–4				3.48						1792.40
4–5				2.03						
5–6				1.74						Estimated
6–7				6.82						2222.00
4–7				4.68						
X–1				14.60						
X–3				12.35						
X–7				7.70						
Tie 7–7										

Span 50'-0" Rise 10'-0" Distance centre to centre 12'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.59		16.90		+ 20.49	6.73	2-3½"×3"×5/16"	13.2		
B–2	"		15.75		+ 19.34	"	"	"		
C–5	"		14.98		+ 18.57	"	"	"		
D–6	"		14.30		+ 17.89	"	"	"	710.70	
1–2	.61		1.62		+ 2.23	3.00	1-2½×2×¼	3.7	22.20	
2–3	.83		2.11		- 2.94	7.25	"	"	53.65	
3–4	1.23		3.24		+ 4.47	5.38	2- "	7.4	79.62	
4–5	.83		2.11		- 2.94	7.25	1- "	3.7	53.65	
5–6	.61		1.62		+ 2.23	3.00	1- "	"	22.20	
6–7	2.50		6.48		- 8.98	7.25	2- "	7.4		
4–7	1.69		4.35		- 6.04	7.25	2- "	"	214.60	
X–1	3.84		15.10		- 18.94	7.25	2-3½"×3"×5/16"	13.2		
X–3	3.04		12.90		- 15.94	7.25	"	"		
X–7	1.30		8.60		- 9.99	11.00	"	"	660.00	
Tie 7–7						8.69	1-2½×2×¼	3.7	32.08	
									1848.70	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
										Calculated
A–1				19.39	2-3½×2½×5/16	13.2				Weight 1st #
B–2				18.30	"	"				2126.00
C–5				17.60	"	"				
D–6	Total 277.30			17.00	"	"	656.85			Final Cal.
1–2	on change of			2.10	1-2½×2×¼	3.7	22.20			1744.85
2–3	stresses			2.77	"	"	53.65			261.73 #
3–4	261.73			4.20	2- "	7.4	79.62			2006.58
4–5				2.77	1- "	3.7	53.65			
5–6				2.10	1- "	"	22.20			Estimated #
6–7				8.45	2- "	7.4				2812.00
4–7				5.70	2- "	"	314.60			
X–1				17.85	2-3½×2½×5/16	13.2				
X–3				14.40	"	"				
X–7				9.45	"	"	610.00	Total		
Tie 7–7					1-2½×2×¼	3.7	32.08	1744.85		

Span 50'-0" Rise 10'-0" Distance centre to centre 15'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.38		19.95		24.33	6.73	2-4 × 3 × 3/8	17.0		
B–2	"		19.20		23.58	"	"	"		
C–5	"		18.40		22.78	"	"	"		
D–6	"		17.60		21.98	"	"	"	915.28	
1–2	.75		1.98		2.73	3.00	1-2½ × 2 × ¼	3.7	22.20	
2–3	.96		2.65		3.61	7.25	"	"	53.65	
3–4	1.50		4.00		5.50	5.38	2- "	7.4	79.62	
4–5	.96		2.65		3.61	7.25	1- "	3.7	53.65	
5–6	.75		1.98		2.73	3.00	"	7.4	22.20	
6–7	3.00		7.98		10.98	7.25	2- "	"		
4–7	2.60		5.35		7.95	"	"	"	214.60	
X–1	4.65		18.60		23.25	"	2-4 × 3 × 3/8	17.0		
X–3	3.72		15.90		19.62	"	"	"		
X–7	1.80		10.60		12.40	21.00	"	"	850.00	
Tie 7–7							1-2½ × 2 × ¼	3.7	32.08	
									2243.28	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				23.33	2-4×3× 5/16	14.4				1st Calculated
B–2				22.58	"					Weight
C–5				21.90	"					2609.94
D–6	Total 366.66			21.00	"		775.30			
1–2	on change of			2.65	1-2½×2×¼	3.7	22.20			Final Cal.
2–3	stresses			3.46	1- "	"	53.65			1973.30
3–4	296.00			5.20	2- "	7.4	79.62			296.00
4–5				3.46	1- "	3.7	53.65			2269.30
5–6				2.65	1- "	"	22.20			
6–7				10.25	2- "	7.4				Estimated
4–7				7.59	"	"	214.60			3375.00
X–1				22.30	2-4×3× 5/16	14.4				
X–3				18.85	"	"				
X–7				11.90	"	"	720.00	Total		
Tie 7–7					1-2½×2×¼	3.7	32.08	1973.30		

Span 50'-0" Rise 10'-0" Distance centre to centre 17'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	5.10		23.55		28.65	6.73	2-5"×3"×3/8"	19.6		
B–2	"		22.75		27.85	"	"	"		
C–5	"		21.75		26.85	"	"	"		
D–6	"		20.80		25.90	"	"	"	1055.26	
1–2	.87		2.35		3.22	3.00	1-2½×2×¼	3.7	22.20	
2–3	1.92		3.14		5.06	7.25	1-3×2½×¼	4.5	65.25	
3–4	1.74		4.70		6.44	5.38	2-2½×2×¼	7.4	79.62	
4–5	1.92		3.14		5.06	7.25	1-3×2½×¼	4.5	65.25	
5–6	.87		2.35		3.22	3.00	1-2½×2×¼	3.7	22.20	
6–7	3.50		9.40		12.90	7.25	2-3×2½×¼	9.0		
4–7	2.42		6.35		8.77	"	"	"	260.00	
X–1	5.41		21.90		27.31	"	2-5×3×5/16	19.6		
X–3	4.33		18.82		23.15	"	"	"		
X–7	1.96		12.50		14.46	21.00	"	"	980.00	
Tie 7–7							1-2½×2×¼	3.7	27.75	
									2577.53	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				23.33	2-4×3×5/16	14.4				1st Calculated
B–2				22.58	"	"				Weight
C–5				21.90	"	"				2262.66
D–6	Total 385.13			21.00	"	"	775.30			Final Cal.
1–2	on change			2.65	1-2½×2×¼	3.7	22.20			2176.65
2–3	of stress			4.75	1- "	"	53.65			326.50
3–4	326.50			6.20	2- "	7.4	79.62			2503.15
4–5				4.75	1- "	3.7	53.65			
5–6				3.09	1- "	"	22.20			Estimated
6–7				12.20	2- "	7.4				3938.00
4–7				8.50	2- "	"	214.60			
X–1				25.70	2-5×3×5/16	16.4				
X–3				21.00	"	"				
X–7				13.75	"	"	820.00	/ Total		
Tie 7–7					1-2½×2×¼	3.7	27.75	2176.65		

Span 50'-0" Rise 10'-0" Distance centre to centre 20'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	5.83		25.40		31.23	6.73	2-5×3×3/8	19.6		
B–2	"		25.19		31.02	"	"	"		
C–5	"		24.95		30.78	"	"	"		
D–6	"		23.90		29.73	"	"	"	1055.27	-
1–2	1.00		2.69		3.69	3.00	1-2½×2×¼	3.7	22.20	
2–3	1.33		3.58		4.91	7.25	"	"	53.65	
3–4	2.00		5.40		7.40	5.38	2- "	7.4	79.42	
4–5	1.33		3.58		4.91	7.25	1- "	3.7	53.65	
5–6	1.00		2.69		3.69	3.00	1- "	3.7	22.20	
6–7	4.00		10.10		14.10	7.25	2-3×2½×5/16	11.2		
4–7	2.75		7.25		10.00	"	"	"	324.80	
X–1	6.25		25.00		31.25	"	2-5×3×3/8	19.6		
X–3	4.95		21.50		26.45	"	"	"	568.40	-
X–7	2.28		14.30		16.58	21.00	2-5×3×5/16	17.4	365.40	
Tie 7–7							1-2½×2×¼	3.7	27.75	
									2572.74	-1623.6

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				28.95					-1623.6	1st Calculated
B–2				28.75					+1348.6	Weight
C–5				28.45					- 275	2960.15
D–6	Total 387.41			27.50	2-5×3½×5/16	17.4	118.50?			Final Cal.
1–2				3.42					2460.2	2960.15
2–3				4.55					- 275	388.50
3–4				6.84					2685.2 + 387.4	2571.65
4–5				4.55					30736	
5–6				3.42						Estimated
6–7				13.30						4500.00
4–7				9.23						
X–1				28.80	2-4×3×5/16	14.2	270.00?			
X–3				24.45			388.50	+1348.6		
X–7				15.30						
Tie 7–7										

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Span 50'-0" Rise 10'-0" Distance centre to centre 22'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	6.55		31.00		37.55	6.75	2-6"×3½"×⅜"	23.4		
B–2	"		29.80		36.35	"	"	"		
C–5	"		28.55		35.10	"	"	"		
D–6	"		27.40		33.95	"	"	"	1259.85	
1–2	1.12		3.10		4.22	3.00	1-2½×2×¼	3.7	22.20	
2–3	1.52		4.15		5.67	7.25	1-3×2½×¼	4.5	65.25	
3–4	2.24		6.20		8.44	5.38	2-2½×2×¼	7.4	79.62	
4–5	1.52		4.15		5.67	7.25	1-3×2½×¼	4.5	65.25	
5–6	1.12		3.10		4.22	3.00	1-2½×2×¼	7.4	22.20	
6–7	4.50		12.40		16.90	7.25	2-3×2½×5/16	11.2		
4–7	3.10		8.35		11.45	"	"	11.2	324.80	
X–1	7.00		28.80		35.80	"	2-5×3½×⅜	20.8		
X–3	5.55		24.70		30.25	"	"	"	603.20	
X–7	2.51		16.50		19.00	21.00	2-5×3½×5/16	17.4	365.40	
Tie 7–7							1-2½×2×¼	3.7	27.75	
									2835.50	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
										1st Calculated
A–1				34.60	2-5×3½×⅜	20.8				Weight
B–2				33.50	"	"				3280.60
C–5				32.45	"	"				
D–6	Total 445.08			31.30	"	"	1119.87			Final Cal.
1–2	on change			3.90	1-2½×2×¼	3.7	22.20			2640.34
2–3	of stresses			5.21	1-3×2½×¼	4.5	65.25			396.00
3–4	396.			7.80	2-2½×2×¼	7.4	79.62			3036.34
4–5				5.21	1-3×2½×¼	4.5	65.25			
5–6				3.90	1-2½×2×¼	3.7	22.20			Estimated
6–7				15.60	2-3×2½×¼	9.0				5063.–
4–7				10.58	"	"	324.80			
X–1				33.00	2-5×3×⅜	19.6				
X–3				28.90	"	"	569.00			
X–7				17.50	2-5×3×5/16	16.4	344.40	Total		
Tie 7–7					1-2½×2×¼	3.7	27.75	2640.34		

Span 50'-0" Rise 10'-0" Distance centre to centre 25'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	7.30		34.75		42.05	6.75	2-6×4×3/8	24.60		
B–2	"		33.40		40.70	"	"	"		
C–5	"		30.00		39.30	"	"	"		
D–6	"		30.80		38.10	"	"	"	1284.50	
1–2	1.25		3.47		4.72	3.00	1-2½×2×¼	3.7	22.20	
2–3	1.70		4.63		6.33	7.25	1-2×2½×¼	4.5	65.25	
3–4	2.50		6.95		9.45	5.38	2-2½×2×¼	7.4	79.62	
4–5	1.70		4.63		6.23	7.25	1-3×2½×¼	4.5	65.25	
5–6	1.25		3.47		4.72	3.00	1-2½×2×¼	3.7	22.20	
6–7	5.10		13.90		19.00	7.25	2-3×2½×5/16	11.2		
4–7	3.45		9.35		12.80	"	"	"	324.80	
X–1	7.85		32.25		40.10	"	2-5×4×3/8	22.00		
X–3	6.20		27.50		33.70	"	"	"		
X–7	2.80		18.40		21.20	21.00	"	"	1100.00	
Tie 7–7			.		.		1-2½×2×¼	3.7	22.75	
									2986.57	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
										1st Calculated
A–1				39.05	2-6×3½×3/8	23.40				Weight
B–2				37.80	"	"				3452.47
C–5				36.60	"	"				
D–6	Total 465.20			35.50	"	"	1260.00			Final Cal.
1–2	on change			4.53	1-2½×2×¼	3.7	22.20			2897.57
2–3	of stresses			5.98	1- "	"	43.65			460.80
3–4	460.80			9.06	2- "	7.4	79.62			3358.37
4–5				5.98	1- "	3.7	43.65			
5–6				4.53	1- "	"	22.20			Estimated
6–7				17.85	2-3×2½×5/16	11.2				5625.00
4–7				12.00	"	"	703.20			
X–1				37.35	2-5×3½×3/8	20.8				
X–3				31.30	"	"	374.80			
X–7				19.60	2-5×3½×5/16	17.4	365.40	Total		
Tie 7–7					1-2½×2×¼	3.7	22.75	2897.57		

Span 50'-0" Rise 12'-6" Distance centre to centre 10'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	2.78		11.00		13.78	7.00	2-3½ × 2½ × ¼	9.8		
B–2	"		10.40		13.18	"	"	"		
C–5	"		9.75		12.53	"	"	"		
D–6	"		9.15		11.93	"	"	"	548.60	
1–2	.62		1.25		1.87	3.50	1 - 2½ × 2 × ¼	3.7	25.90	
2–3	.70		1.40		2.10	7.80	1 - "	"	56.72	
3–4	1.24		2.50		3.74	7.00	2 - "	7.4	103.60	
4–5	.70		1.40		2.10	7.80	1 - "	3.7	56.72	
5–6	.62		1.25		1.87	3.50	1 - "	"	25.90	
6–7	2.08		4.25		6.33	7.80	2 - "	7.4		
4–7	1.38		2.85		4.23	7.80	2 - "	"	230.88	
X–1	3.10		9.85		12.95	"	2 - 3 × 2½ × ¼	9.0		
X–3	2.42		8.45		10.87	"	"	"		
X–7	1.04		5.65		6.69	18.80	"	"	450.00	
Tie 7–7							1 - 2½ × 2 × ¼	3.7	32.08	
									1498.52	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				13.58						
B–2				12.98						
C–5				12.28						
D–6	Total			11.73	No Change.					Final Cal.
1–2	249.00			1.84						1498.52
2–3				2.70						249.00
3–4				3.69						1747.52
4–5				2.70						
5–6				1.84						Estimated
6–7				6.23						2222.00
4–7				4.16						
X–1				12.70						
X–3				10.67						
X–7				5.56						
Tie 7–7										

Span 50'-0" Rise 12'-6" Distance centre to centre 12'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.48		14.00		17.48	7.00	2 - 3½ × 2½ × 5/16	12.2		
B–2	"		13.25		16.73	"	"	"		
C–5	"		12.40		15.88	"	"	"		
D–6	"		11.65		15.13	"	"	"	683.20	
1–2	.78		1.59		2.37	3.50	1 - 2½ × 2 × ¼	3.7	25.90	
2–3	.87		1.68		2.55	7.80	1 - "	"	56.72	
3–4	1.56		3.18		4.74	7.00	2 - "	7.4	103.60	
4–5	.87		1.68		2.55	7.80	1 - "	3.7	56.72	
5–6	.78		1.59		2.37	3.50	1 - "	"	25.90	
6–7	2.62		5.40		8.02	7.80	2 - "	7.4		
4–7	1.60		3.63		5.23	"	2 - "	"	230.88	
X–1	3.90		12.50		16.40	"	2 - 3 × 2½ × ¼	9.0		
X–3	3.03		10.75		13.78	"	"	"		
X–7	1.50		7.20		8.50	18.80	"	"	450.00	
Tie 7–7										
									1632.92	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				16.88						
B–2				16.23						
C–5				15.28						
D–6	Total			14.66	No Change					Final Wt.
1–2	265.00			2.30						1632.92
2–3				2.47						265.00
3–4				4.60						1897.92
4–5				2.47						
5–6				2.30						Estimated
6–7				7.77						2812.00
4–7				5.05						
X–1				15.80						
X–3				13.40						
X–7				8.40						
Tie 7–7										

Span 50'-0" Rise 12'-6" Distance centre to centre 15'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.15		16.90		21.05	7.00	2-3½×3×⅜	15.8		
B–2	"		15.95		20.10	"	"	"		
C–5	"		15.00		19.15	"	"	"		
D–6	"		14.00		18.15	"	"	"	884.80	
1–2	.93		1.92		2.85	3.50	1-2½×2×¼	3.7	25.90	
2–3	1.05		2.15		3.20	7.80	1- "	"	56.72	
3–4	1.86		3.84		5.70	7.00	2- "	7.4	103.60	
4–5	1.05		2.15		3.20	7.80	1- "	3.7	56.72	
5–6	.93		1.92		2.85	3.50	1- "	"	25.90	
6–7	3.13		6.52		9.65	7.80	2- "	7.4		
4–7	2.07		4.37		6.44	"	2- "	"	230.88	
X–1	4.65		15.10		19.75	"	2-3½×2½×5/16	12.2		
X–3	3.63		13.00		16.63	"	"	"		
X–7	1.56		8.70		10.26	18.80	"	"	610.00	
Tie 7–7										
									1994.52	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				20.15						1st Calculated
B–2				19.35						Weight
C–5				18.35						2354.52
D–6	Total 360.00			17.15						Final Cal.
1–2	on change			2.72						1747.76
2–3	of stresses			3.10						296.00
3–4	296.00			5.50						2043.76
4–5				3.10						
5–6				2.72						Estimated
6–7				9.33						3375.00
4–7				6.22						
X–1				19.00	2-3×2½×5/16	11.2	349.44			
X–3				16.03	"	"	169.20			
X–7				9.91	2-3×2½×¼	9.0	1229.12			
Tie 7–7							1747.76			

Span 50'-0" Rise 17'-6" Distance centre to centre 17'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.95		19.70		24.65	7.00	2-3½ × 3 × 3/8	15.8		
B–2	"		18.60		23.55	"	"	"		
C–5	"		17.40		22.35	"	"	"		
D–6	"		16.30		21.25	"	"	"	884.80	
1–2	1.10		2.23		3.33	3.50	1-3½ × 3 × ¼	3.7	25.90	
2–3	1.25		2.50		3.75	7.80	1- "	"	56.72	
3–4	2.20		4.46		6.66	7.00	2- "	7.4	103.60	
4–5	1.25		2.50		3.75	7.80	1- "	3.7	56.72	
5–6	1.10		2.23		3.33	3.50	1- "	"	25.90	
6–7	3.75		7.60		11.35	7.80	2- "	7.4		
4–7	2.46		5.10		7.56	"	2- "	7.4	230.88	
X–1	5.52		17.60		23.12	"	2-3½ × 3 × 5/16	13.2		
X–3	4.33		15.10		19.43	"	"	"		
X–7	1.86		10.10		11.96	18.80	"	"	660.00	
Tie 7–7										
									2044.52	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
										1st Calculated
A–1				23.85	2-4 × 3 × 5/16	14.4				Weight
B–2				22.75	"	"				2454.52
C–5				21.70	"	"				
D–6	Total 410.0			20.55	"	"	806.40			Final Cal.
1–2	on change			3.25						1916.12
2–3	of stress			3.65						383.22
3–4	383.22			6.50						2299.34
4–5				3.65						
5–6				3.25			155.40			Estimated
6–7				11.05						3938.00
4–7				7.36						
X–1				22.32	2-3½ × 3 × ¼	12.2	610.00			
X–3				18.83	"	"				
X–7				11.56	"	"	344.32			
Tie 7–7							1916.12			

Span 56'-0" Rise 12'-6" Distance centre to centre 20'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	5.56		23.10		28.66	7.00	2-5x3x$\frac{3}{8}$	19.6		
B–2	"		21.80		27.36	"	"	"		
C–5	"		20.50		26.06	"	"	"		
D–6	"		19.20		24.76	"	"	"	1097.60	
1–2	1.26		2.63		3.89	3.50	1-2$\frac{1}{2}$x2x$\frac{1}{4}$	3.7	25.90	
2–3	1.42		2.95		4.37	7.80	1- "	"	56.72	
3–4	2.50		5.26		7.76	7.00	2- "	7.4	103.60	
4–5	1.42		2.95		4.37	7.60	1- "	3.7	56.72	
5–6	1.26		2.63		3.89	3.50	1- "	"	25.90	
6–7	4.20		8.90		13.10	7.80	2-3x2$\frac{1}{2}$x$\frac{1}{4}$	9.0		
4–7	2.80		6.00		8.80	"	"	"	280.80	
X–1	6.28		20.60		26.88	"	2-4x3x$\frac{5}{16}$	14.4		
X–3	4.90		17.80		22.70	"	"	"		
X–7	2.10		11.85		13.95	18.80	"	"	720.00	
Tie 7–7										
									2367.24	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				27.16	2-4x3x$\frac{3}{8}$	17.0				1st Calculated
B–2				25.96	"	"				Weight
C–5				24.66	"	"				2840.68
D–6	Total 473.44			23.56	"	"	952.00			Final Wt.
1–2	on change			3.71						2161.64
2–3	of stress			4.17						432.32
3–4	432.32			7.42						2593.96
4–5				4.17						
5–6				3.71			155.40			Estimated
6–7				12.50						4500.00
4–7				8.40						
X–1				25.48	2-3$\frac{1}{2}$x3x$\frac{5}{16}$	13.2	394.24			
X–3				21.50	"	"				
X–7				13.20	"	"	660.00			
~~Tie 7–7~~							2161.64			

Span 50'-0" Rise 12'-6" Distance centre to centre 22'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	6.30		26.30		32.60	7.00	2-5×3½×5/16	17.4		
B–2	"		24.95		31.25	"	"	"		
C–5	"		23.30		29.60	"	"	"		
D–6	"		21.80		28.10	"	"	"	972.40	
1–2	1.41		3.00		4.41	3.50	1-2½×2×¼	3.7	25.90	
2–3	1.59		3.35		4.94	7.80	1- "	"	56.72	
3–4	2.82		6.00		8.82	7.00	2- "	7.4	103.60	
4–5	1.59		3.35		4.94	7.80	1- "	3.7	56.72	
5–6	1.41		3.00		4.41	3.50	1- "	"	25.90	
6–7	4.75		10.18		14.93	7.80	2-3×2½×¼	9.0		
4–7	3.14		6.80		9.94	"	"	"	280.80	
X–1	7.05		23.50		30.55	"	2-3½×3×3/8	15.8		
X–3	5.50		20.20		25.70	"	"	"	492.96	
X–7	2.36		13.50		15.86	18.80	2-3½×3×5/16	13.2	248.10	
Tie 7–7										
									2374.30	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				31.30						
B–2				29.90						
C–5				28.30						
D–6	Final			27.05	No Change					Final Wt.
1–2	477.66			4.26						2374.30
2–3				4.77						477.66
3–4				8.52						2851.96
4–5				4.77						
5–6				4.26						
6–7				14.35						
4–7				9.59						
X–1				29.30						
X–3				24.70						
X–7				15.16						
Tie 7–7										

Span 50-0 Rise 12'-6" Distance centre to centre 25'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	7.25		29.80		37.05	7.00	2-5×3½×5/16	17.4		
B–2	"		28.25		35.50	"	"	"		
C–5	"		26.50		33.75	"	"	"		
D–6	"		24.80		32.05	"	"	"	1125.20	
1–2	1.62		3.40		5.02	3.50	1-2½×2×¼	3.7	25.90	
2–3	1.62		3.80		5.62	7.80	1- "	"	56.72	
3–4	3.24		6.80		10.04	7.00	2- "	7.4	103.60	
4–5	1.62		3.80		5.62	7.80	1- "	3.7	56.72	
5–6	1.62		3.40		5.02	3.50	1- "	3.7	25.90	
6–7	5.40		11.50		16.90	7.80	2-3×2½×5/16	11.2	349.44	
4–7	3.60		7.75		11.35	"	"	"		
X–1	8.05		26.70		34.75	"	2-3½×3½×⅜	17.0		
X–3	6.30		22.90		29.20	"	"	"	530.40	
X–7	2.70		15.30		18.00	18.80	2-3½×3½×5/16	14.4	270.72	
Tie 7–7										
									2544.60	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				35.75						
B–2				34.75						
C–5				32.50						
D–6	Final 500.0			31.30	No Change					Final Wt.
1–2				4.87						2544.60
2–3				5.45						500.00
3–4				9.74						3044.60
4–5				5.45						
5–6				4.87						Estimated
6–7				16.40						5625.00
4–7				11.00						
X–1				33.55						
X–3				28.10						
X–7				17.30						
Tie 7–7										

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Span 50'-0" Rise 15'-0" Distance centre to centre 10'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	2.66		10.25		12.91	7.29	2-3½×2½×¼	9.8		
B–2	"		9.45		12.11	"	"	"		
C–5	"		8.70		11.36	"	"	"		
D–6	"		7.95		10.61	"	"	"	571.54	
1–2	.75		1.30		2.05	4.42	1-2½×2×¼	3.7	32.70	
2–3	.75		1.30		2.05	8.50	1- "	"	62.90	
3–4	1.50		2.60		4.10	8.75	2- "	7.4	129.50	
4–5	.75		1.30		2.05	8.50	1- "	3.7	62.90	
5–6	.75		1.30		2.05	4.42	1- "	"	32.70	
6–7	2.20		3.80		6.00	8.50	2- "	7.4		
4–7	1.45		2.50		3.95	"	2-2½×2×4/16	"	251.60	
X–1	3.10		8.75		11.85	"	2-2½×2×5/16	9.0		
X–3	2.40		7.50		9.90	"	"	"	144.50	
X–7	.95		5.00		5.85	16.00	2-2½×2×¼	7.4	118.40	
Tie 7–7						(in Details)	1-2½×2×¼	3.7		
									1406.74	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1										
B–2										
C–5										
D–6	Final			No Change						Final Wt.
1–2	312.72									1406.74
2–3										312.72
3–4										1719.46
4–5										
5–6										Estimated
6–7										2222.00
4–7										
X–1										
X–3										
X–7										
Tie 7–7										

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Span 50'-0" Rise 15'-0" Distance centre to centre 12'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.32		12.30		15.62	7.29	2 - 3 × 2½ × 5/16	11.2		
B–2	"		11.30		14.62	"	"	"		
C–5	"		10.42		13.72	"	"	"		
D–6	"		9.52		12.64	"	"	"	653.18	
1–2	.94		1.58		2.52	4.42	1 - 2½ × 2 × ¼	3.7	32.70	
2–3	.94		1.58		2.52	8.50	1 - "	"	62.90	
3–4	1.88		3.16		5.04	8.75	2 - "	7.4	129.50	
4–5	.94		1.58		2.52	8.50	1 - "	3.7	62.90	
5–6	.94		1.58		2.52	4.42	1 - "	3.7	32.70	
6–7	2.75		4.55		7.30	8.50	2 - "	7.4		
4–7	1.81		3.00		4.81	"	"	"	251.60	
X–1	3.87		10.52		14.39	"	2 - 2½ × 2 × 3/8	10.6		
X–3	3.00		9.00		12.00	"	"	"	360.40	
X–7	1.19		6.00		7.19	16.00	2 - 2½ × 2 × ¼	7.4	118.40	
Tie 7–7							1 - 2½ × 2 × ¼	3.7		
									1704.28	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				15.47						
B–2				14.47						
C–5				13.57						
D–6	Final Total			12.67	No Change					Final Wt.
1–2	340.86			2.49						1704.28
2–3				2.49						340.86
3–4				4.98						2045.14
4–5				2.49						
5–6				2.49						Estimated
6–7				7.20						2812.00
4–7				4.76						
X–1				14.17						
X–3				11.85						
X–7				7.09						
Tie 7–7										

Span 50'-0" Rise 15'-0" Distance centre to centre 15'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.00		14.90		18.90	7.29	2 - 3½ × 2½ × 5/16	12.2		
B–2	"		13.75		17.75	"	"	"		
C–5	"		12.65		16.65	"	"	"		
D–6	"		11.60		15.90	"	"	"	711.50	
1–2	1.13		1.89		3.02	4.42	1 - 2½ × 2 × ¼	3.7	32.70	
2–3	1.13		1.89		3.02	8.50	1 - "	"	62.90	
3–4	2.26		3.80		6.06	8.75	2 - "	7.4	129.50	
4–5	1.13		1.89		3.02	8.50	1 - "	3.7	62.90	
5–6	1.13		1.89		3.02	4.42	1 - "	"	32.70	
6–7	3.33		5.52		8.85	6.50	2 - "	7.4		
4–7	2.19		3.65		5.84	"	"	"	251.60	
X–1	4.68		12.70		17.38	"	2 - 3½ × 2½ × 5/16	11.2		
X–3	3.62		10.45		14.07	"			380.60	
X–7	1.44		7.30		8.74	16.00	2 - 3 × 2½ × ¼	9.0	144.00	
Tie 7–7										
									1808.60	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				18.25						
B–2				17.19						
C–5				16.15						
D–6	Total			15.10	No Change					Final Wt.
1–2	311.70			2.95						1808.60
2–3				2.95						311.70
3–4				5.91						2120.30
4–5				2.95						
5–6				2.95						Estimated
6–7				8.63						3375.0
4–7				5.69						
X–1				16.88						
X–3				13.62						
X–7				8.44						
Tie 7–7										

Span 50'-0" Rise 15'-0" Distance centre to centre 17'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.65		17.50		22.15	7.29	2-4×3×5/16	14.4		
B–2	"		16.15		20.80	"	"	"		
C–5	"		15.00		19.65	"	"	"		
D–6	"		13.60		18.25	"	"	"	642.40	
1–2	1.32		2.23		3.55	4.42	1-2½×2×¼	3.7	32.70	
2–3	1.32		2.23		3.55	8.50	1- "	"	62.90	
3–4	2.64		4.46		7.10	8.75	2- "	7.4	129.50	
4–5	1.32		2.23		3.55	8.50	1- "	3.7	62.90	
5–6	1.32		2.23		3.55	4.42	1- "	3.7	32.70	
6–7	3.85		6.50		10.35	8.50	2- "	7.4		
4–7	2.55		4.27		6.82	"	"	"	251.60	
X–1	5.42		14.95		20.37	"	2-3½×2½×5/16	12.2		
X–3	4.20		12.80		17.00	"	"	"	414.80	
X–7	1.67		8.55		10.22	16.00	2×3½×2½×¼	9.8	156.80	
Tie 7–7							1- 2½×2×¼	3.7		
									1986.30	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				21.40						
B–2				20.05						
C–5				18.95						
D–6	Final Total			17.65	No Change					Final Wt.
1–2	379.08			3.45						1986.30
2–3				3.45						379.08
3–4				6.90						2365.38
4–5				3.45						
5–6				3.45						Estimated
6–7				10.05						3938.0
4–7				6.63						
X–1				19.67						
X–3				16.40						
X–7				9.82						
Tie 7–7										

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Span 50'-0" Rise 15'-0" Distance centre to centre 20'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	5.30		21.00		26.30	7.29	2-5×3×5/16	16.4		
B–2	"		19.25		24.55	"	"	"		
C–5	"		17.75		23.05	"	"	"		
D–6	"		16.20		21.50	"	"	"	839.80	
1–2	1.50		2.65		4.15	4.42	1-2½×2×5/16	4.5	39.78	
2–3	1.50		2.65		4.15	8.50	1-2½×2×¼	3.7	62.90	
3–4	3.50		5.30		8.80	8.75	2-2½×2×5/16	9.0	157.50	
4–5	1.50		2.65		4.15	8.50	1-2½×2×¼	3.7	62.90	
5–6	1.50		2.65		4.15	4.42	1- "	"	39.78	
6–7	4.40		7.75		12.15	8.50	2- "	7.4		
4–7	2.90		5.10		8.00	"	"	"	251.60	
X–1	6.20		17.85		24.05	"	2-4×3×5/16	14.4		
X–3	4.80		15.30		20.10	"	"	"		
X–7	1.90		10.20		12.10	16.00	"	"	720.00	
Tie 7–7							1-2½×2×¼	3.7		
									2174.26	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				25.30						
B–2				23.70						
C–5				22.40						
D–6	Total			20.75	No Change					Final Wt.
1–2	432.00			4.03						2174.26
2–3				4.03						432.00
3–4				8.56						2606.26
4–5				4.03						
5–6				4.03						Estimated
6–7				11.80						4500.00
4–7				7.77						
X–1				23.20						
X–3				19.70						
X–7				11.65						
Tie 7–7										

Span 50'-0" Rise 15'-0" Distance centre to centre 22'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	6.00		22.50		28.50	7.29	2-5×3½×5/16	17.4		
B–2	"		20.75		26.75	"	"	"		
C–5	"		19.10		25.10	"	"	"		
D–6	"		18.35		24.35	"	"	"	1017.90	
1–2	1.69		2.85		4.54	4.42	1-3×2½×¼	4.5	39.78	
2–3	1.69		2.85		4.54	8.50	1-2½×2×¼	3.7	62.90	
3–4	3.38		5.70		9.08	8.75	2-3×2½×¼	9.0	157.50	
4–5	1.69		2.85		4.54	8.50	1-2½×2×¼	3.7	62.90	
5–6	1.69		2.85		4.54	4.42	1-3×2½×¼	4.5	39.78	
6–7	4.95		8.35		13.30	8.50	2-2½×2×¼	7.4		
4–7	3.27		5.50		8.77	"	"	"	251.90	
X–1	6.98		19.20		26.18	"	2-5×3×5/16	16.2		
X–3	5.40		16.50		21.90	"	"	"		
X–7	2.15		11.00		13.15	16.00	"	"	810.00	
Tie 7–7							1-2½×2×¼	3.7		
									2442.66	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				27.50						
B–2				25.80						
C–5				24.30						
D–6	Total			23.50	No Change					Final Wt.
1–2	457.42			4.42						2442.66
2–3				4.42						457.42
3–4				8.64						2900.08
4–5				4.42						
5–6				4.42						Estimated
6–7				12.90						5063.00
4–7				8.52						
X–1				25.28						
X–3				21.15						
X–7				12.65						
Tie 7–7										

Span 50'-0" Rise 15'-0" Distance centre to centre 25'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	6.65		33.00		39.65	7.29	2 - 6 x 3½ x ⅜	23.4		
B–2	"		25.50		32.15	"		"		
C–5	"		23.40		30.05	"		"		
D–6	"		21.40		28.05	"		"	1368.90	
1–2	1.87		3.50		5.37	4.42	1 - 3 x 2½ x ¼	4.5	39.78	
2–3	1.88		3.50		5.38	8.50	1 - "	"	76.50	
3–4	3.75		7.00		10.75	8.75	2 - 3 x 2½ x ¼	9.0	157.50	
4–5	1.88		3.50		5.38	8.50	1 - "	4.5	76.50	
5–6	1.87		3.50		5.37	4.42	1 - "	4.5	39.78	
6–7	5.50		10.25		15.75	8.50	2 - "	9.0		
4–7	3.62		6.72		10.34	"	2 - "	"	306.00	
X–1	7.75		23.50		31.25	"	2 - 4 x 3 x ⅜	17.0		
X–3	6.00		20.20		26.20	"	"	"	289.00	
X–7	2.38		13.20		15.58	16.00	2 - 4 x 3 x 5/16	14.4	230.40	
Tie 7–7										
									2584.36	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				37.65						
B–2				30.35						
C–5				28.30						
D–6	Total			26.65	No Change					Final Wt.
1–2	516.60			5.12						2584.36
2–3				5.63						516.60
3–4				10.25						3100.96
4–5				5.63						
5–6				5.12						Estimated
6–7				15.10						5625.0
4–7				9.87						
X–1				29.75						
X–3				24.80						
X–7				14.68						
Tie 7–7										

Span 50'-0" Rise 17'-6" Distance centre to centre 10'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	2.56		8.88		11.44	7.63	2-3 × 2½ × ¼	9.0		
B–2	"		8.02		10.58	"	"	"		
C–5	"		7.20		9.76	"	"	"		
D–6	"		6.36		8.92	"	"	"	549.36	
1–2	.89		1.20		2.09	5.33	1-2½ × 2 × ¼	3.7	39.44	
2–3	.78		1.04		1.82	9.30	"	"	68.82	
3–4	1.78		2.38		4.16	10.66	2- "	7.4	157.76	
4–5	.78		1.04		1.82	9.30	1- "	3.7	68.82	
5–6	.89		1.20		2.09	5.33	1- "	3.7	39.44	
6–7	2.32		3.08		5.40	9.30	2- "	7.4		
4–7	1.54		2.08		3.62	"	"	"	275.28	
X–1	3.11		7.28		10.39	"	2-2½ × 2 × ¼	"		
X–3	2.34		6.22		8.56	"	"	"		
X–7	.78		4.16		4.94	12.80	"	"	370.00	
Tie 7–7										
									1568.92	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				11.76						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	258.10									1568.92
2–3										258.10
3–4										1827.02
4–5										
5–6										Estimated
6–7										2250.0
4–7										
X–1										
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 17'-6" Distance centre to centre 12'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.20		11.37		14.57	7.63	2-3×2½×5/16	11.2		
B–2	"		10.22		13.42	"	"	"		
C–5	"		9.20		12.40	"	"	"		
D–6	"		8.12		11.32	"	"	"	683.65	
1–2	1.11		1.54		2.65	5.33	1-2½×2×¼	3.7	39.44	
2–3	.97		1.33		2.30	9.30	"	"	68.82	
3–4	2.22		3.05		5.27	10.66	2-2½×2½×¼	8.2	174.82	
4–5	.97		1.33		2.30	9.30	1-2½×2×¼	3.7	68.82	
5–6	1.11		1.54		2.65	5.33	1- "	3.7	39.44	
6–7	2.92		3.94		6.86	9.30	2- "	7.4		
4–7	1.92		2.67		4.59	9.30	2- "	"	275.28	
X–1	3.88		9.30		13.18	"	2-3×2½×¼	9.0		
X–3	2.92		7.95		10.87	"	"	"		
X–7	.97		5.32		6.27	17.80	"	"	450.00	
Tie 7–7										
									1800.27	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight
A–1				14.40					
B–2									
C–5									
D–6	Total								
1–2	327.00								
2–3									
3–4									
4–5									
5–6									
6–7									
4–7							Diff		
X–1				12.92	2-2½×2½×¼	8.2	40.00		
X–3									
X–7									
Tie 7–7									

1st Calculated
1800.27
327.00
2127.27

Final
2127.27
40.00
2087.27

Estimated
2812.50

Span 50'-0" Rise 17'-6" Distance centre to centre 15'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.84		13.32		17.16	7.63	2-3½ × 2½ × 5/16	12.2		
B–2	"		12.25		16.09	"		"		
C–5	"		11.00		14.82	"		"		
D–6	"		9.72		13.56	"		"	744.69	
1–2	1.34		1.84		3.18	5.33	1-2½ × 2½ × ¼	4.1	43.71	
2–3	1.19		1.60		2.79	9.30	1-2½ × 2 × ¼	3.7	68.82	
3–4	2.67		3.64		6.31	10.66	2-3 × 2½ × ¼	9.0	191.88	
4–5	1.19		1.60		2.79	9.30	1-2½ × 2 × ¼	3.7	68.82	
5–6	1.34		1.84		3.18	5.33	1-2½ × 2½ × ¼	4.1	43.71	
6–7	3.48		4.72		8.20	9.30	2-2½ × 2 × ¼	7.4		
4–7	2.32		3.20		5.52	"	"	"	275.28	
X–1	4.67		11.15		15.82	"	2-3 × 2½ × ¼	9.0		
X–3	3.52		9.54		13.06	"	"	"		
X–7	1.19		6.38		7.57	12.80	"	"	450.00	
Tie 7–7	.		.		.					
									1886.91	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				16.64						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	384.0									1886.91
2–3										384.00
3–4				6.17						2270.91
4–5										
5–6										Estimated
6–7										3375.0
4–7										
X–1				15.40						
X–3										
X–7										
Tie 7–7										

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Span 50'-0" Rise 17'-6" Distance centre to centre 17'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.48		15.98		20.46	7.63	2-4×3×5/16	14.4		
B–2	"		14.41		18.89	"	"	"		
C–5	"		12.67		17.35	"	"	"		
D–6	"		11.43		15.91	"	"	"	878.98	
1–2	1.56		2.16		3.72	5.33	1-2½×2½×¼	4.1	43.71	
2–3	1.36		1.87		3.23	9.30	1-2½×2×¼	3.7	68.82	
3–4	3.12		4.28		7.40	10.66	2-3×2½×¼	9.0	191.88	
4–5	1.36		1.87		3.23	9.30	1-2½×2×¼	3.7	68.82	
5–6	1.56		2.08		3.64	5.33	1-2½×2½×¼	4.1	43.71	
6–7	4.05		5.55		9.60	9.30	2-2½×2×¼	7.4		
4–7	2.70		3.74		6.44	"	"	"	275.28	
X–1	5.44		13.10		18.54	"	2-3½×2½×¼	9.8		
X–3	4.10		11.20		15.30	"	"	"		
X–7	1.36		7.49		8.84	12.80	"	"	490.00	
Tie 7–7										
									2061.20	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				19.66						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	435.0			3.63						2061.20
2–3										435.00
3–4				7.24						2496.20
4–5										
5–6										Estimated
6–7										3937.52
4–7										
X–1				18.04						
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 17'-6" Distance centre to centre 20'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	5.12		18.45		23.57	7.63	2-5×3×5/16	16.4		
B–2	"		16.70		21.82	"	"	"		
C–5	"		15.00		20.12	"	"	"		
D–6	"		13.12		18.24	"	"	"	1001.06	
1–2	1.78		2.50		4.28	5.33	1-3×2½×¼	4.5	47.97	
2–3	1.56		2.17		3.73	9.30	1-2½×2×¼	3.7	68.82	
3–4	3.56		4.97		8.53	10.66	2-3×2½×¼	9.0	191.88	
4–5	1.56		2.17		3.73	9.30	1-2½×2×¼	3.7	68.82	
5–6	1.78		2.50		4.28	5.33	1-3×2½×¼	4.5	47.97	
6–7	4.64		6.42		11.06	9.30	2-2½×2×¼	7.4		
4–7	3.04		4.34		7.38	"	"	"	275.28	
X–1	6.22		15.08		21.30	"	2-3×2½×5/16	11.2		
X–3	4.68		13.00		17.68	"	"	"		
X–7	1.56		8.68		10.24	12.80	"	"	560.00	
Tie 7–7										
									2261.80	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				23.18						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	490.0			4.22						2261.80
2–3										490.00
3–4				8.41						2751.80
4–5										
5–6										Estimated
6–7										4500.00
4–7										
X–1				21.08						
X–3										
X–7										
Tie 7–7										

Span 50'-0 Rise 17'-6 Distance centre to centre 22'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	5.75		21.10		26.85	7.63	2-5"×3"×5/16"	16.4		
B–2	"		19.00		24.75	"		"		
C–5	"		17.08		22.83	"		"		
D–6	"		15.09		20.84	"		"	1001.06	
1–2	2.00		2.85		4.85	5.33	1-3×2½×¼	4.5	47.97	
2–3	1.76		2.47		4.23	9.30	1-2½×2×¼	3.7	68.82	
3–4	4.00		5.65		9.65	10.66	2-3½×2½×¼	9.8	208.94	
4–5	1.76		2.47		4.23	9.30	1-2½×2×¼	3.7	68.82	
5–6	2.00		2.85		4.85	5.33	1-3×2½×¼	4.5	47.97	
6–7	5.21		7.32		12.53	9.30	2-2½×2×¼	7.4	275.28	
4–7	3.46		4.94		8.40	"	"	"		
X–1	7.00		17.22		24.22	"	2-3½×2½×5/16	12.2		
X–3	5.26		14.80		20.06	"	"	"		
X–7	1.76		9.88		11.64	12.80	"	"	610.00	
Tie 7–7										
									2328.86	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				25.91						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	530.0			4.72						2328.86
2–3										530.00
3–4				9.40						2858.86
4–5										
5–6										Estimated
6–7										5062.5
4–7										
X–1				23.46						
X–3										
X–7										
Tie 7–7										

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Span 50'-0" Rise 17'-6" Distance centre to centre 25'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	6.37		23.85		30.22	7.63	2-5 × 3½ × 5/16	17.4		
B–2	"		21.58		27.95	"	"	"		
C–5	"		19.35		25.72	"	"	"		
D–6	"		17.08		23.45	"	"	"	1062.10	
1–2	2.22		3.22		5.44	5.33	1-3½ × 2½ × ¼	4.9	52.23	
2–3	1.94		2.80		4.74	9.30	1-2½ × 2 × ¼	3.7	68.82	
3–4	4.44		6.40		10.84	10.66	2-3½ × 2½ × ¼	9.8	208.94	
4–5	1.94		2.80		4.74	9.30	1-2½ × 2 × ¼	3.7	68.82	
5–6	2.22		3.22		5.44	5.33	1-3½ × 2½ × ¼	4.9	52.23	
6–7	5.78		8.30		14.08	9.30	2-2½ × 2 × ¼	7.4		
4–7	3.83		5.60		9.43	"	"	"	275.28	
X–1	7.77		19.55		27.32	"	2-4 × 3 × 5/16	14.4		
X–3	5.81		16.87		22.68	"	"	"		
X–7	1.94		11.18		13.12	12.80	"	"	720.00	
Tie 7–7										
									2506.42	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				29.07						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	554.00			5.39						2506.42
2–3										554.00
3–4				10.54						3062.42
4–5										
5–6										Estimated
6–7										5625.00
4–7										
X–1				26.37						
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 20'-0" Distance centre to centre 10'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	2.40		9.20		11.60	8.00	2-3 x 2½ x ¼	9.00		
B–2	"		8.15		10.50	"	"	"		
C–5	"		7.15		9.55	"	"	"		
D–6	"		6.10		8.50	"	"	"	576.00	
1–2	1.04		1.30		2.34	6.40	1-3 x 2½ x ¼	4.5	57.60	
2–3	.82		1.00		1.82	10.30	1-2½ x 2 x ¼	3.7	76.22	
3–4	2.08		2.60		4.68	12.80	2-3 x 2½ x ¼	9.0	230.40	
4–5	.82		1.00		1.82	10.30	1-2½ x 2 x ¼	3.7	76.22	
5–6	1.04		1.30		2.34	6.40	1-3 x 2½ x ¼	4.5	57.60	
6–7	2.48		3.10		5.58	10.30	2-2½ x 2 x ¼	7.4	304.88	
4–7	1.64		2.10		3.74	"	"	"		
X–1	3.12		7.15		10.27	"	2- "	"		
X–3	2.24		6.15		8.39	"	"	"		
X–7	.60		4.10		4.70	8.80	"	"	370.00	
Tie 7–7										
									1748.92	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1										
B–2										
C–5										
D–6	Total									Final Cal.
1–2	204.35			No Change						1748.92
2–3										204.35
3–4										1953.27
4–5										
5–6										Estimated
6–7										2222.00
4–7										
X–1										
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 20'-0" Distance centre to centre 12'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.10		10.32		13.42	8.00	2-3×2½×5/16	11.20		
B–2	"		9.45		12.55	"	"	"		
C–5	"		8.30		11.40	"	"	"		
D–6	"		7.08		10.18	"	"	"	716.80	
1–2	1.31		1.50		2.81	6.40	1-3×2½×¼	4.5	57.60	
2–3	1.15		1.13		2.28	10.30	1-2½×2×¼	3.7	70.22	
3–4	2.62		3.05		5.67	12.80	2-3×2½×¼	9.0	230.40	
4–5	1.15		1.13		2.28	10.30	1-2½×2×¼	3.7	76.22	
5–6	1.31		1.50		2.81	6.40	1-3×2½×¼	4.5	57.60	
6–7	3.12		3.60		6.72	10.30	2-2½×2×¼	7.4		
4–7	2.06		2.43		4.49	"	"	"	304.88	
X–1	3.92		6.30		12.22	"	2-3×2½×¼	9.0		
X–3	2.82		7.12		9.92	"	"	"		
X–7	.75		4.75		5.50	8.80	"	"	450.00	
Tie 7–7										
									1969.72	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1										
B–2										
C–5										
D–6	Total									Final Wt.
1–2	228.62			No Change						1969.72
2–3										228.62
3–4										2198.34
4–5										
5–6										Estimated
6–7										2812.00
4–7										
X–1										
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 20'-0" Distance centre to centre 15'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow + Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.61		12.90		16.51	8.00	2-$3\frac{1}{2}\times 2\frac{1}{2}\times\frac{15}{16}$	12.20		
B–2	"		11.21		14.82	"	"	"		
C–5	"		10.00		13.61	"	"	"		
D–6	"		8.55		12.16	"	"	"	780.80	
1–2	1.58		1.82		3.40	6.40	1-$3\times 2\frac{1}{2}\times\frac{1}{4}$	4.5	57.60	
2–3	1.20		1.40		2.60	10.30	1-$2\frac{1}{2}\times 2\times\frac{1}{4}$	3.7	76.22	
3–4	3.15		3.65		6.80	12.80	2-$3\times 2\frac{1}{2}\times\frac{1}{4}$	9.0	230.40	
4–5	1.20		1.40		2.60	10.30	1-$2\frac{1}{2}\times 2\times\frac{1}{4}$	3.7	76.22	
5–6	1.58		1.82		3.40	6.40	1-$3\times 2\frac{1}{2}\times\frac{1}{4}$	4.5	57.60	
6–7	3.75		4.35		8.10	10.30	2-$2\frac{1}{2}\times 2\times\frac{1}{4}$	7.4		
4–7	2.97		2.95		5.92	"	"	"	304.88	
X–1	4.70		10.00		14.70	"	2-$3\frac{1}{2}\times 2\frac{1}{2}\times\frac{1}{4}$	9.8		
X–3	3.38		8.57		11.95	"	"	"		
X–7	.81		5.75		6.56	4.40	"	"	490.00	
Tie 7–7										
									2073.72	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				16.11						
B–2				14.51						
C–5				13.26						
D–6	Total			11.86	No Change					Final Wt.
1–2	244.50			3.24						2073.72
2–3				2.55						244.50
3–4				6.67						2318.22
4–5				2.55						
5–6				3.24						Estimated
6–7				7.95						3375.0
4–7				5.82						
X–1				14.35						
X–3				11.65						
X–7				6.36						
Tie 7–7										

Span 50'-0" Rise 20'-0" Distance centre to centre 17'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.23		15.50		19.73	8.00	2-3½"×3"×5/16"	13.20		
B–2	"		13.75		17.98	"	"	"		
C–5	"		12.05		16.28	"	"	"		
D–6	"		10.30		14.53	"	"	"	844.80	
1–2	1.84		2.19		4.03	6.40	1-3×2½×¼	4.5	57.60	
2–3	1.45		1.68		3.13	10.30	1-2½×2×¼	3.7	76.22	
3–4	3.68		4.38		8.06	12.80	2-3½×2½×5/16	11.2	286.72	
4–5	1.45		1.68		3.13	10.30	1-2½×2×¼	3.7	76.22	
5–6	1.84		2.19		4.03	6.40	1-3×2½×¼	4.5	57.60	
6–7	4.25		5.22		9.47	10.30	2-2½×2×¼	7.4		
4–7	2.90		3.55		6.45	"	"	"	304.88	
X–1	5.50		12.05		17.55	"	2-3½×2½×5/16	12.2		
X–3	3.95		10.35		14.30	"	"	"	502.64	
X–7	1.03		6.90		7.93	4.40	2-3½×2½×¼	9.8	86.24	
Tie 7–7									2292.92	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				18.48						
B–2				16.83						
C–5				15.33						
D–6	Total			13.76	No Change					Final Wt.
1–2	268.75			3.93						2292.92
2–3				3.02						268.75
3–4				7.73						2561.67
4–5				3.02						
5–6				3.93						Estimated
6–7				9.05						3938.00
4–7				6.15						
X–1				16.55						
X–3				13.45						
X–7				8.96						
Tie 7–7										

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Span 50'-0" Rise 20'-0" Distance centre to centre 20'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.80		17.85		22.65	8.00	2-3½ × 3 × ⅜	15.80		
B–2	"		15.42		20.22	"	"	"		
C–5	"		13.90		18.70	"	"	"		
D–6	"		11.85		16.65	"	"	"	1011.20	
1–2	2.04		2.53		4.54	6.40	1 – 3 × 2½ × ¼	4.5	57.60	
2–3	1.64		1.94		3.58	10.30	1 – 2½ × 2 × ¼	3.7	76.22	
3–4	4.08		5.05		9.13	12.80	2 – 3½ × 2½ × 5/16	12.2	286.72	
4–5	1.64		1.94		3.58	10.30	1 – 2½ × 2 × ¼	3.7	76.22	
5–6	2.04		2.53		4.57	6.40	1 – 3 × 2½ × ¼	4.5	57.60	
6–7	4.96		6.00		10.96	10.30	2 – 2½ × 2 × ¼	7.4		
4–7	3.28		4.08		7.36	"	"	"	304.66	
X–1	6.24		13.90		20.14	"	2 – 3½ × 3 × 5/16	13.2		
X–3	4.48		12.00		16.48	"	"	"		
X–7	1.20		8.00		9.20	4.40	"	"	660.00	
Tie 7–7										
									2530.44	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				21.90						
B–2				19.60						
C–5				18.10						
D–6	Total			16.20	No Change					Final Cal.
1–2	291.00			4.47						2530.44
2–3				3.51						291.00
3–4				8.93						2821.44
4–5				3.51						
5–6				4.47						Estimated
6–7				10.71						4500.0
4–7				7.18						
X–1				19.54						
X–3				15.98						
X–7				8.85						
Tie 7–7										

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Span 50'-0" Rise 20'-0" Distance centre to centre 22'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	5.40		20.40		25.80	8.00	2-4×3×5/8	17.0		
B–2	"		18.10		23.50	"	"	"		
C–5	"		15.90		21.30	"	"	"		
D–6	"		13.60		19.00	"	"	"	1088.00	
1–2	2.35		2.85		5.20	6.40	1-3½×2½×¼	4.5	57.60	
2–3	1.85		2.22		4.07	10.30	1-2½×2×¼	3.7	76.22	
3–4	4.70		5.80		10.50	12.80	2-3½×2½×5/16	11.2	286.72	
4–5	1.85		2.22		4.07	10.30	1-2½×2×¼	3.7	76.22	
5–6	2.35		2.85		5.20	6.40	1-3½×2½×¼	4.5	57.60	
6–7	5.60		6.90		12.50	10.30	2-2½×2×¼	7.4		
4–7	3.70		4.65		8.35	"	"	"	304.88	
X–1	7.00		15.90		22.90	"	2×4×3×5/16	14.4		
X–3	5.05		13.75		18.80	"	"	"		
X–7	1.36		9.10		10.46	4.40	"	"	720.00	
Tie 7–7										
									2667.24	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				24.80						
B–2				22.60						
C–5				20.59						
D–6	Total			18.30	No Change					Final Wt.
1–2	320.63			5.06						2667.24
2–3				3.98						320.63
3–4				10.12						2987.87
4–5				3.98						
5–6				5.06						
6–7				12.18						
4–7				8.12						
X–1				22.19						
X–3				18.15						
X–7				10.14						
Tie 7–7										

47

Span 50'-0" Rise 20'-0" Distance centre to centre 25'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	6.00		24.90		30.90	8.00	2 - 5 × 3½ × ⅜	20.80		
B–2	"		22.00		28.00	"	"	"		
C–5	"		19.40		25.40	"	"	"		
D–6	"		16.50		22.50	"	"	"	1331.20	
1–2	2.60		3.50		6.10	6.40	1 - 3½ × 3 × 5/16	6.6	84.48	
2–3	2.05		2.70		4.75	10.30	1 - 3 × 2½ × ¼	4.5	92.70	
3–4	5.20		7.00		12.20	12.80	2 × 3½ × 3 × 5/16	13.2	337.92	
4–5	2.05		2.70		4.75	10.30	1 - 3 × 2½ × ¼	4.5	92.70	
5–6	2.60		3.50		6.10	6.40	1 - 3½ × 3 × 5/16	6.6	8448	
6–7	6.20		8.40		14.60	10.30	2 - 3 × 2½ × ¼	9.0		
4–7	4.10		5.70		9.80	"	"	"	370.80	
X–1	7.80		19.40		27.20	"	2 - 3½ × 3 × ⅜	15.8		
X–3	5.60		16.60		22.20	"	"	"	650.96	
X–7	1.50		11.10		12.60	4.40	2 - 3½ × 3 × 5/16	13.2	116.16	
Tie 7–7										
									3161.40	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1										
B–2										
C–5										
D–6	Total			No Change						Final Wt.
1–2	372.40									3161.40
2–3										372.40
3–4										3533.80
4–5										
5–6										Estimated
6–7										5625.00
4–7										
X–1										
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 22'-6" Distance centre to centre 10'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	2.20		8.14		10.34	8.41	2–3 × 2½ × ¼	9.0		
B–2	"		7.10		9.30	"	"	"		
C–5	"		6.06		8.26	"	"	"		
D–6	"		5.02		7.22	"	"	"	605.52	
1–2	1.17		1.16		2.33	7.60	1 – 3 × 2½ × ¼	4.5	68.40	
2–3	.88		.84		1.72	11.33	1 – 2½ × 2 × ¼	3.7	83.84	
3–4	2.36		2.32		4.68	15.20	2 – 3½ × 2½ × ¼	9.8	297.92	
4–5	.88		.84		1.72	11.33	1 – 2½ × 2 × ¼	3.7	83.84	
5–6	1.17		1.16		2.33	7.60	1 – 3 × 2½ × ¼	4.5	68.40	
6–7	2.64		2.58		5.22	11.33	2 – 2½ × 2 × ¼	7.4	335.37	
4–7	1.76		1.72		3.48	"	"	"		
X–1	2.27		6.06		9.03	"	"	"		
X–3	2.10		5.18		7.28	"	"	"		
X–7	.33		3.46		3.79	4.66	"	"	370.00	
Tie 7–7										
									1913.29	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1										
B–2										
C–5										
D–6	Total			No Change						Final Wt.
1–2	219.00									1913.29
2–3										219.00
3–4										2132.29
4–5										
5–6										Estimated
6–7										2250.00
4–7										
X–1										
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 22'-6" Distance centre to centre 12'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	2.75		10.37		13.12	8.41	2 - 3½ × 2½ × ¼	9.8		
B–2	"		9.02		11.77	"	"	"		
C–5	"		7.70		10.45	"	"	"		
D–6	"		6.38		9.13	"	"	"	659.34	
1–2	1.46		1.48		2.94	7.60	1 - "	4.9	84.48	
2–3	1.10		1.06		2.16	11.33	1 - 2½ × 2 × ¼	3.7	83.84	
3–4	2.94		2.96		5.90	15.20	2 - 3½ × 2½ × 5/16	12.2	370.88	
4–5	1.10		1.06		2.16	11.33	1 - 2½ × 2 × ¼	3.7	83.84	
5–6	1.46		1.48		2.94	7.60	1 - 3½ × 2½ × ¼	4.9	84.48	
6–7	3.28		3.28		6.56	11.33	2 - 2½ × 2 × ¼	7.4		
4–7	2.19		2.18		4.37	"	"	"	335.37	
X–1	3.70		7.70		11.00	"	"	"		
X–3	2.62		6.58		9.18	"	"	"		
X–7	.41		4.40		4.81	4.66	"	"	370.00	
Tie 7–7										
									2072.23	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				13.03						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	272.0			2.92						2072.23
2–3										272.00
3–4				5.86						2344.23
4–5										
5–6										Estimated
6–7										2812.5
4–7										
X–1										
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 12'-6" Distance centre to centre 15'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.30		12.58		15.86	8.41	2 - $3\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$	12.2		
B–2	"		10.97		14.27	"	"	"		
C–5	"		9.35		12.65	"	"	"		
D–6	"		7.75		11.05	"	"	"	820.82	
1–2	1.76		1.79		3.55	7.60	1 - $3\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$	6.1	92.72	
2–3	1.32		1.30		2.62	11.33	1 - $2\frac{1}{2} \times 2 \times \frac{1}{4}$	3.7	83.84	
3–4	3.55		3.58		7.13	15.20	2 - $3\frac{1}{2} \times 3 \times \frac{5}{16}$	13.2	401.28	
4–5	1.32		1.30		2.62	11.33	1 - $2\frac{1}{2} \times 2 \times \frac{1}{4}$	3.7	83.84	
5–6	1.76		1.79		3.55	7.60	1 - $3\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$	6.1	92.72	
6–7	3.96		3.98		7.94	11.33	2 - $2\frac{1}{2} \times 2 \times \frac{1}{4}$	7.4		
4–7	2.65		2.65		5.30	"	"	"	335.37	
X–1	4.45		9.35		13.80	"	2 x $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$	8.2		
X–3	3.15		8.00		11.15	"	"	"		
X–7	.49		5.34		5.83	4.66	"	"	410.00	
Tie 7–7										
									2320.59	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				15.60						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	325.0			3.51						2320.59
2–3										325.00
3–4				7.05						2645.59
4–5										
5–6										Estimated
6–7										3375.0
4–7										
X–1				13.72						
X–3										
X–7										
Tie 7–7										

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Span 50'-0" Rise 22'-6" Distance centre to centre 17'-6"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	3.84		14.80		18.64	8.41	2 - $3\frac{1}{2} \times 3 \times \frac{5}{16}$			
B–2	"		12.96		16.80	"	"			
C–5	"		11.00		14.82	"	"			
D–6	"		9.13		12.97	"	"	13.2	868.10	
1–2	2.04		2.11		4.15	7.60	1 - "	6.6	100.32	
2–3	1.54		1.53		3.07	11.33	1 - $2\frac{1}{2} \times 2 \times \frac{1}{4}$	3.7	83.84	
3–4	4.11		4.22		8.33	15.20	2 - $3\frac{1}{2} \times 3 \times \frac{5}{16}$	13.2	401.28	
4–5	1.54		1.53		3.07	11.33	1 - $2\frac{1}{2} \times 2 \times \frac{1}{4}$	3.7	83.84	
5–6	2.04		2.11		4.15	7.60	1 - $3\frac{1}{2} \times 3 \times \frac{5}{16}$	6.6	100.32	
6–7	4.60		4.70		9.30	11.33	2 - $2\frac{1}{2} \times 2 \times \frac{1}{4}$	7.4		
4–7	3.07		3.15		6.22	"	"	"	335.37	
X–1	5.19		11.00		16.19	"	2 - $3 \times 2\frac{1}{2} \times \frac{1}{4}$	9.0		
X–3	3.66		9.40		13.06	"	"	"		
X–7	.58		5.94		6.52	4.66	"	"	450.00	
Tie 7–7										
									2443.07	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				18.22						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	364.0			4.09						2443.07
2–3										364.00
3–4				6.21						2807.07
4–5										
5–6										Estimated
6–7										3937.50
4–7										
X–1				15.67						
X–3										
X–7										
Tie 7–7										

52

Span 50'-0" Rise 22'-6" Distance centre to centre 20'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.40		17.17		21.57	8.41	2-4 x 3 x 5/16	14.4		
B–2	"		14.96		19.36	"	"	"		
C–5	"		13.73		17.13	"	"	"		
D–6	"		10.58		14.98	"	"	"	968.83	
1–2	2.34		2.44		4.78	7.60	1 - 3½ x 3 x 5/16	6.6	100.32	
2–3	1.76		1.72		3.48	11.33	1 - 2½ x 2 x ¼	3.7	83.84	
3–4	4.72		4.88		9.60	15.20	2-3½ x 3 x 5/16	13.2	401.28	
4–5	1.76		1.72		3.48	11.33	1 - 2½ x 2 x ¼	3.7	83.84	
5–6	2.34		2.44		4.78	7.60	1 - 3½ x 3 x 5/16	6.6	100.32	
6–7	5.28		5.43		10.71	11.33	2-2½ x 2 x ¼	7.4		
4–7	3.52		3.62		7.14	"	"	"	325.37	
X–1	5.94		12.73		18.67	"	2-3½ x 2½ x ¼	9.8		
X–3	4.20		10.90		15.10	"	"	"		
X–7	.66		7.28		7.94	4.66	"	"	490.00	
Tie 7–7										
									2563.80	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				21.20						1st Calculat'd
B–2										Weight
C–5										2994.00
D–6	Total									Final
1–2	430.0			4.71						2994.00
2–3							Pitt +			36.50
3–4				9.46	2 x 4 x 3 x 5/16	14.4	36.5			3030.50
4–5										
5–6										Estimated
6–7										4500.00
4–7										
X–1										
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 22'-6" Distance centre to centre 22'-6"

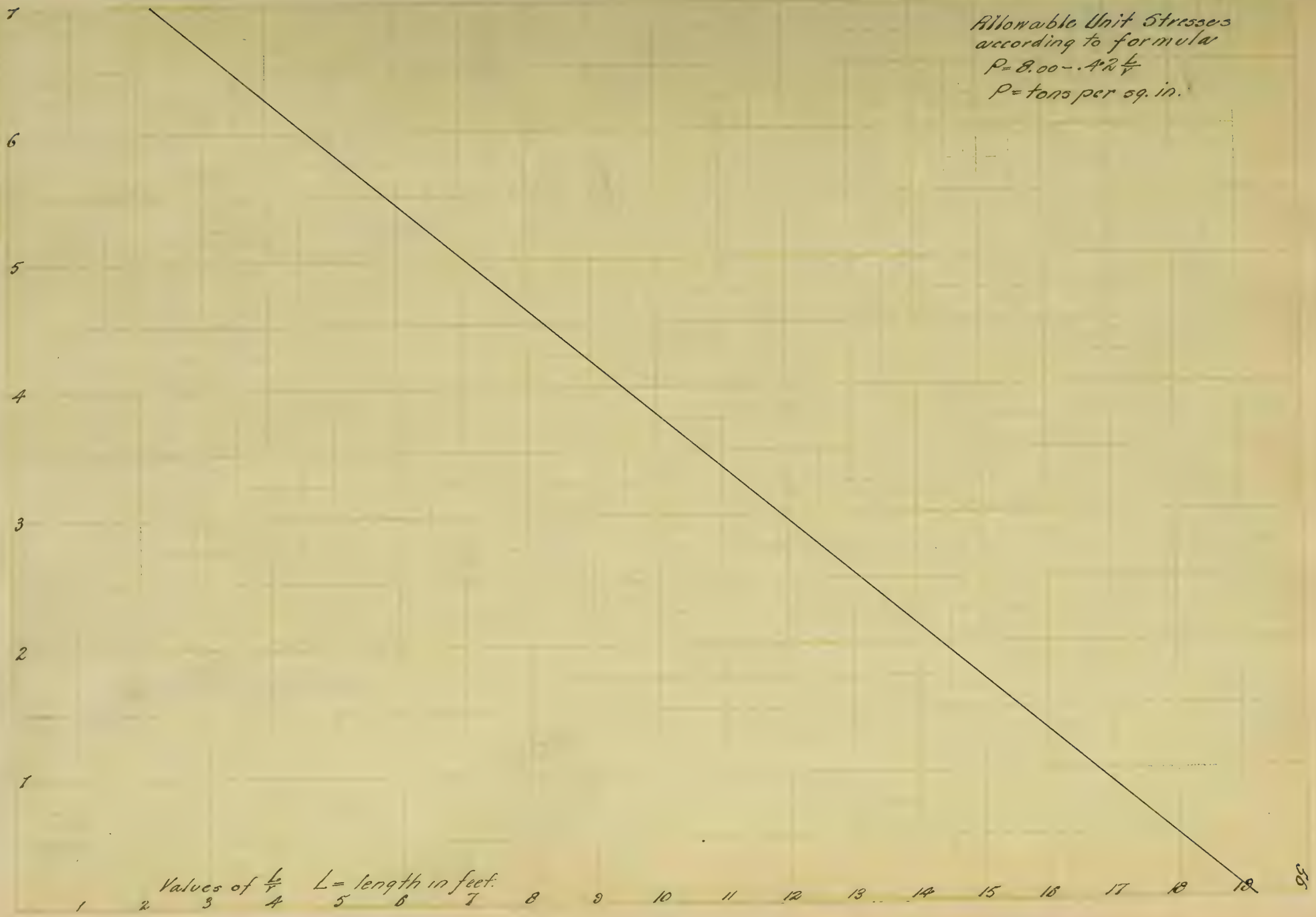
Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	4.95		19.60		24.55	8.41	2 - 5×3×5/16	16.4		
B–2	"		17.08		22.03	"	"	"		
C–5	"		14.60		19.55	"	"	"		
D–6	"		12.01		16.99	"	"	"	1103.39	
1–2	2.63		2.80		5.43	7.60	1 - 3½×3×5/16	6.6	100.32	
2–3	1.98		1.98		3.96	11.33	1 - 2½×2×¼	3.7	83.84	
3–4	5.30		5.60		10.90	15.20	2 - 4×3×5/16	14.4	437.76	
4–5	1.98		1.98		3.96	11.33	1 - 2½×2×¼	3.7	83.84	
5–6	2.65		2.80		5.45	7.60	1 - 3½×3×5/16	6.6	100.32	
6–7	5.92		6.22		12.14	11.33	2 - 2½×2×¼	7.4		
4–7	3.95		4.14		8.09	"	"	"	355.37	
X–1	6.68		14.60		21.28	"	2 - 3×2½×5/16	11.2		
X–3	4.72		12.23		16.95	"	"	"		
X–7	.74		8.33		9.07	4.66	"	"	560.00	
Tie 7–7										
									2804.84	

Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				23.91						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	487.0			5.33						2804.84
2–3										487.00
3–4				10.70						3291.84
4–5										
5–6										Estimated
6–7										5062.5
4–7										
X–1				20.76						
X–3										
X–7										
Tie 7–7										

Span 50'-0" Rise 22'-6" Distance centre to centre 25'-0"

Member	Wind Load Stress Win'd Side	Wind Load Stress Leew'd Side	Snow & Dead Load Stress	Snow Load Stress	Maximum Stress	Centre Line Length	Assumed Section	Weight per Foot	Centre Line Weight	Actual Weight
A–1	5.47		22.25		27.72	8.41	2 - 5 x 3 x 5/16	16.4		
B–2	"		19.40		24.87	"	"	"		
C–5	"		16.55		22.02	"	"	"		
D–6	"		13.73		19.20	"	"	"	1103.39	
1–2	2.98		3.17		6.09	7.60	1 - 4 x 3 x 5/16	7.2	109.44	
2–3	2.19		2.30		4.49	11.33	1 - 2 1/2 x 2 x 1/4	3.7	63.84	
3–4	5.89		6.34		12.23	15.20	2 - 4 x 3 x 5/16	14.4	437.76	
4–5	2.19		2.30		4.49	11.33	1 - 2 1/2 x 2 x 1/4	3.7	63.84	
5–6	2.98		3.17		6.09	7.60	1 - 4 x 3 x 5/16	7.2	109.44	
6–7	6.57		7.06		13.63	11.33	2 - 2 1/2 x 2 1/2 x 1/4	8.2		
4–7	4.38		4.70		9.08	"	"	"	371.62	
X–1	7.40		16.55		23.05	"	2 - 3 1/2 x 3 1/2 x 5/16	12.2		
X–3	5.22		14.17		19.39	"	"	"		
X–7	.82		9.47		10.29	4.66	"	"	610.00	
Tie 7–7										
									2909.33	

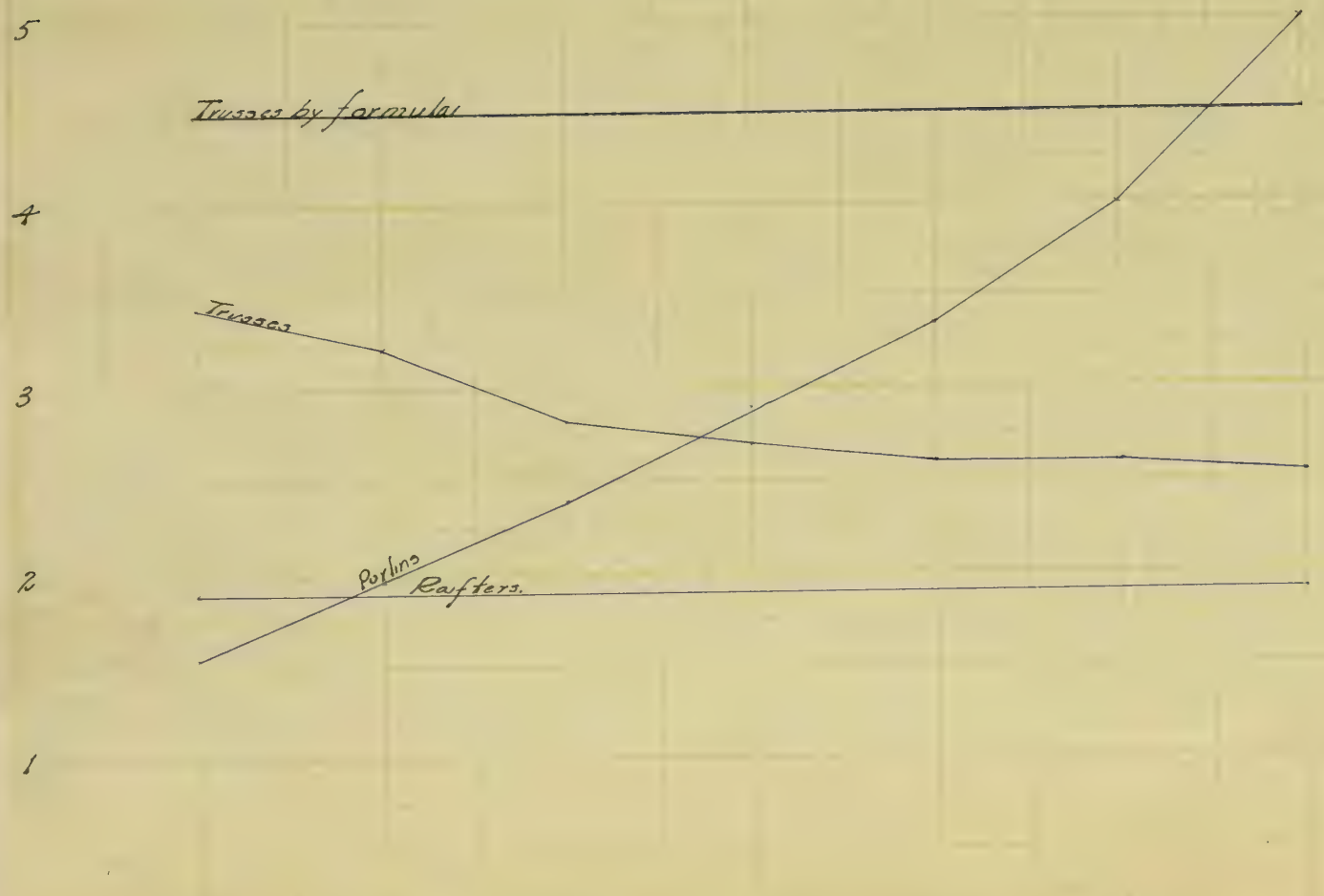
Member	Weight of Details	Corrected Weight of Truss	Decrease in Dead Load Stress	Corrected Maximum Stress	Corrected Section	Weight per Foot	Corrected Centre Line Weight	Corrected Actual Weight	Final Total Weight	
A–1				26.97						
B–2										
C–5										
D–6	Total				No Change					Final Wt.
1–2	540.0			5.96						2909.33
2–3										540.00
3–4				11.99						3449.33
4–5										
5–6										Estimated
6–7										5625.0
4–7										
X–1				23.40						
X–3										
X–7										
Tie 7–7										


Allowable Unit Stresses
according to formula
P = 8.00 − .42 l/r
P = tons per sq. in.
7
6
5
4
3
2
1
Values of l/r L = length in feet.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
35

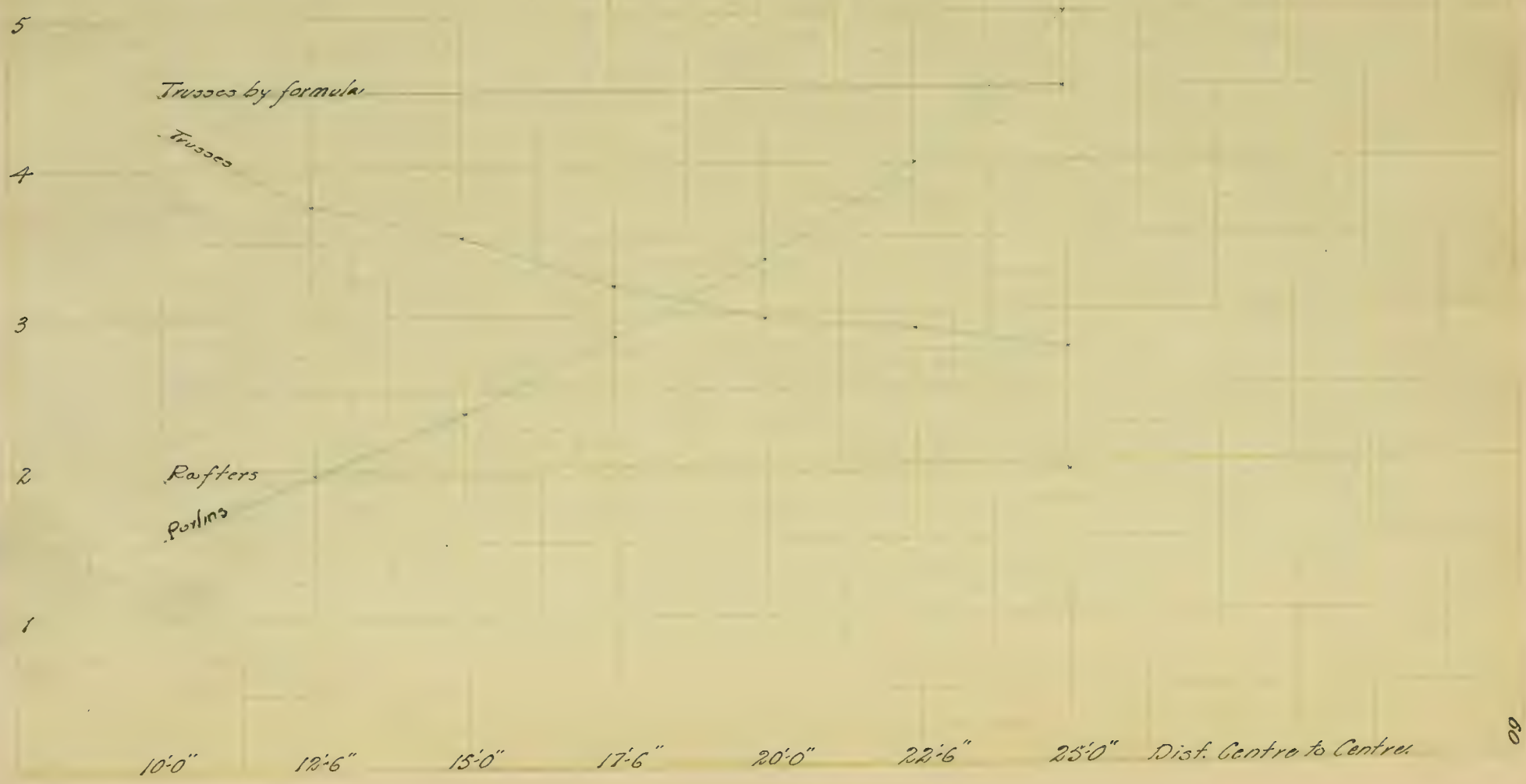
10'-0" Rise
Weight per sq. ft.
Hor. proj. of
Truss, rafter & purlins.

12'-6" Rise
Weight per sq. ft.
Hor. proj. of
Truss, rafters, purlins.

15'-0" Rise
Weight per sq. ft.
Hor. proj. of
Truss, rafters, purlins



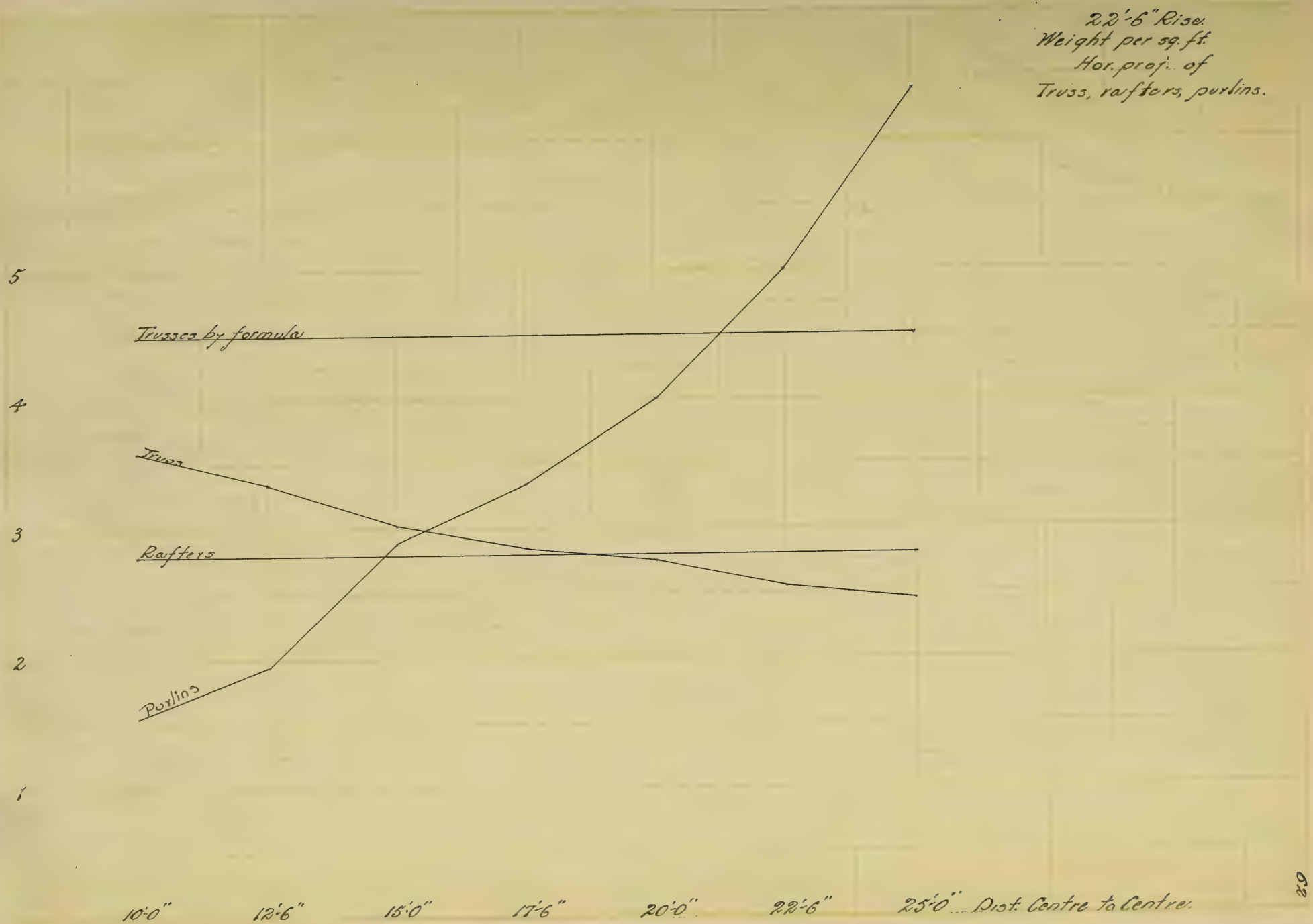
17'-6" Rise
Weight per sq. ft.
Hor. proj. of
Truss, rafters, purlins.



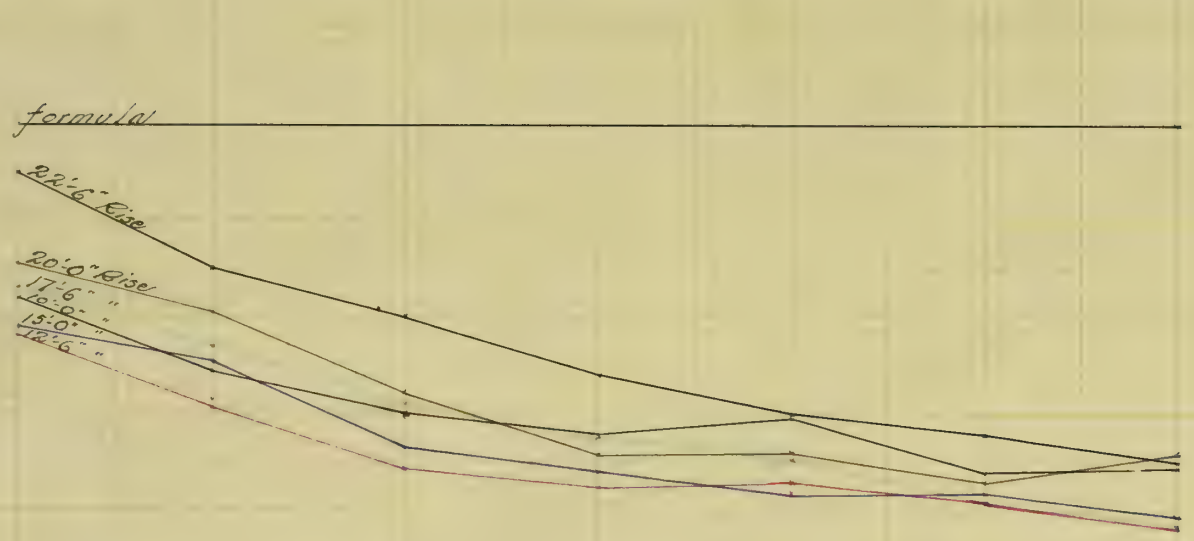
09

20'0" Rise
Weight per sq. ft.
Hor. proj. of
Truss, rafter, purlins.

19


22'-6" Rise.
Weight per sq. ft.
Hor. proj. of
Truss, rafters, purlins.
5
4
3
2
1
Trusses by formula
Truss
Rafters
Purlins
10'-0"
12'-6"
15'-0"
17'-6"
20'-0"
22'-6"
25'-0"
Dist. Centre to Centre.

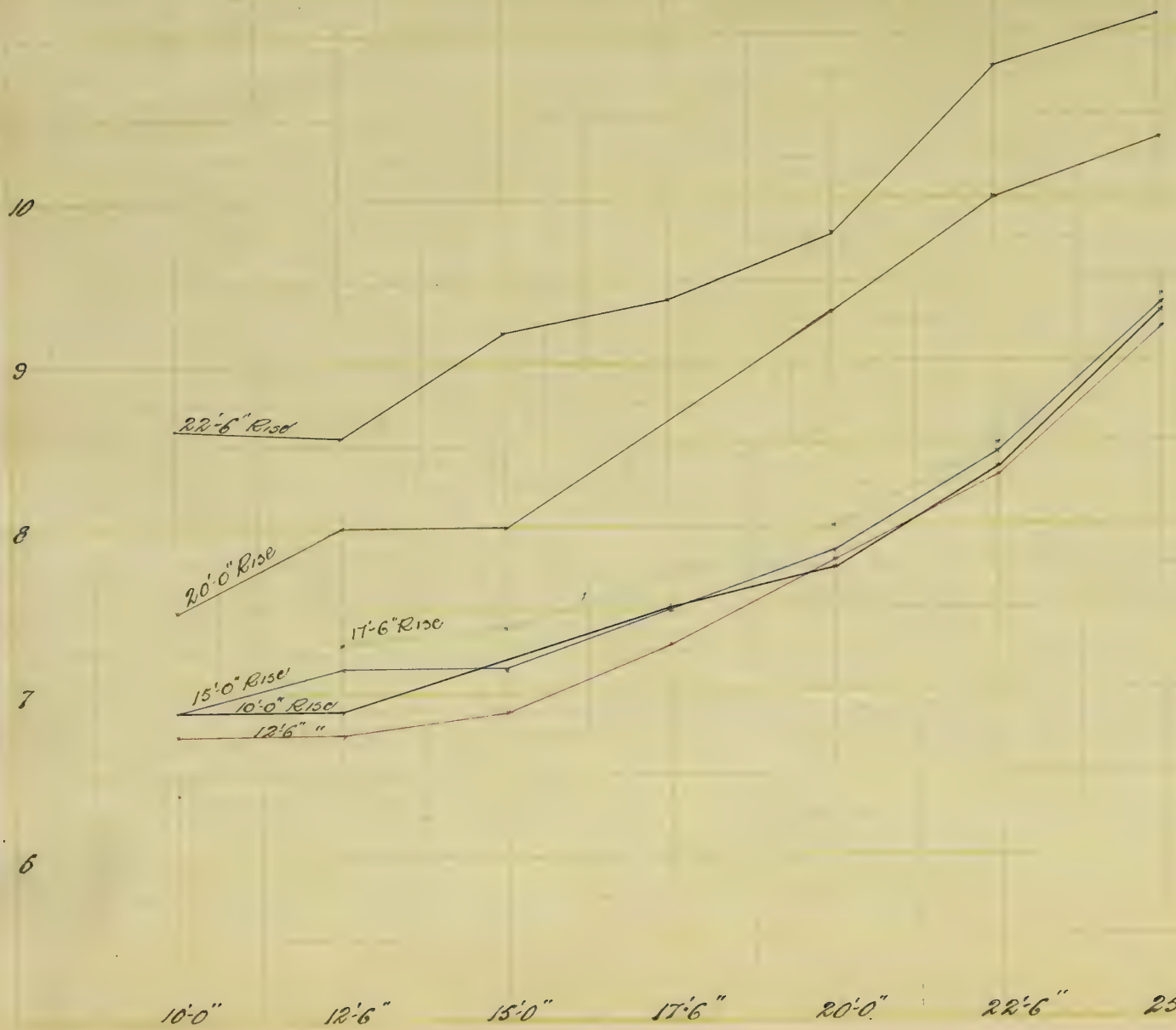
Weight of Trusses
according to Rise
per sq. ft. Hor. proj.



5
4
3
2
1

10'-0" 12'-6" 15'-0" 17'-6" 20'-0" 22'-6" 25'-0" Dist. Centre to Centre.

Weights of
Truss + purlins + rafters
per sq. ft. Hor. proj.



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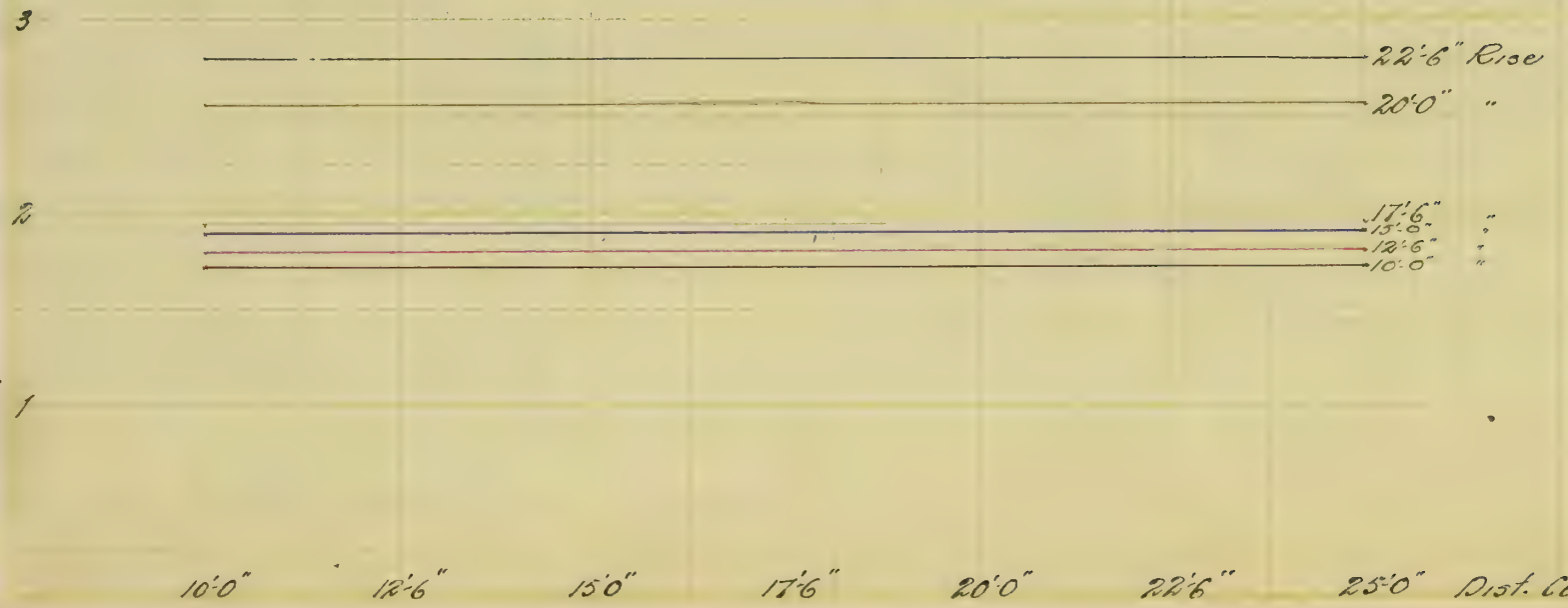
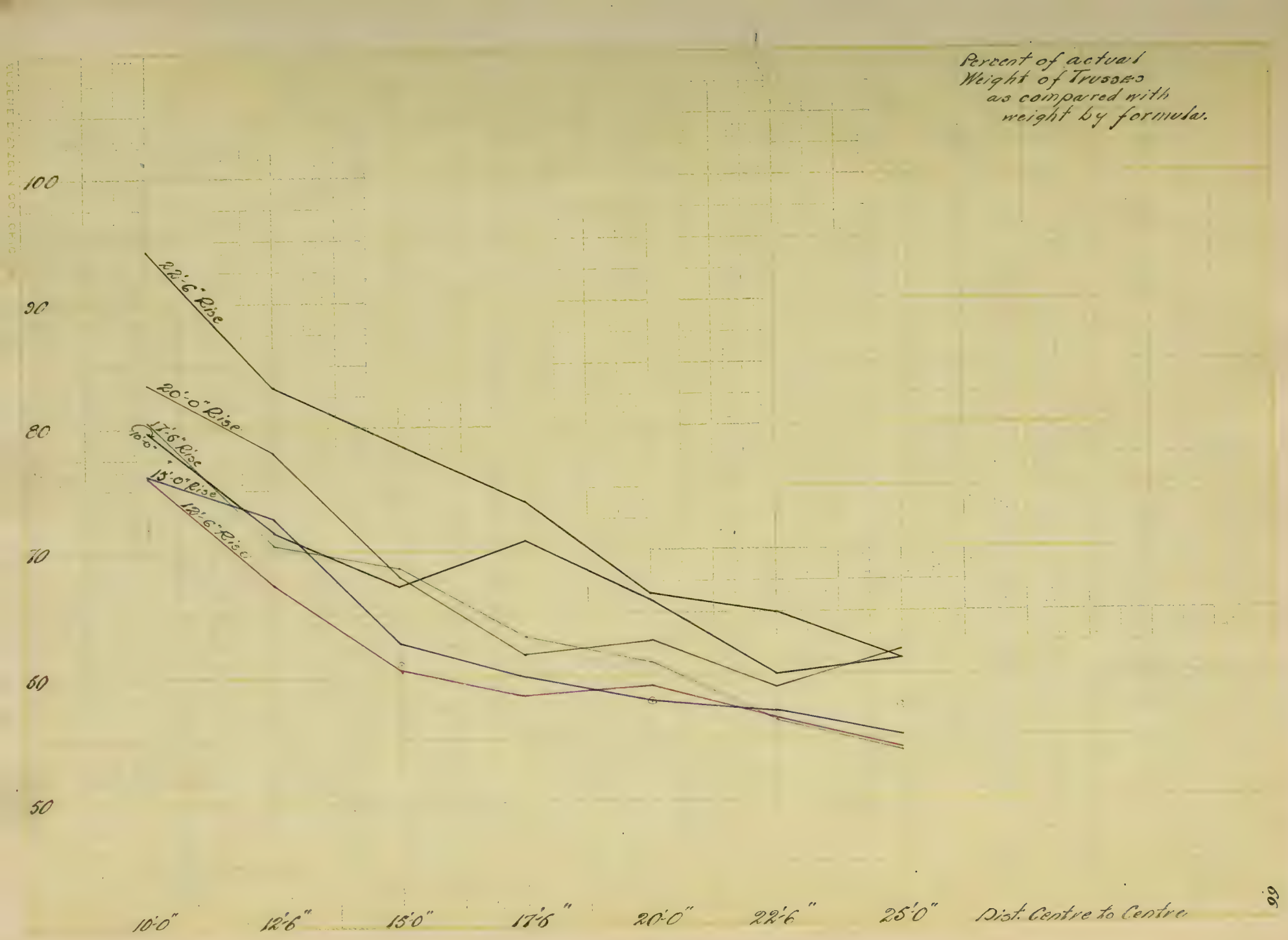
Weight of
Rafters per
sq. ft. Hor. proj.




Percent of actual
Weight of Trusses
as compared with
weight by formula.
100
90
80
70
60
50
22'-6" Rise
20'-0" Rise
17'-6" Rise
15'-0" Rise
12'-6" Rise
10'-0"
10'-0"
12'-6"
15'-0"
17'-6"
20'-0"
22'-6"
25'-0"
Dist. Centre to Centre

Conclusions.

In part some of the facts which the results show are presupposed truths, such as that the increase of spacing centre to centre increases the size of the purlin; that the weight per square foot of horizontal projection of the rafters increases with the rise, and also as the distance centre to centre of trusses.

The weight of the rafters per square foot of horizontal projection was found to vary from 1.73 lbs. to 2.81 lbs. for 10'-0" and 22'-6" rise respectively. The variation in weight is very slight for rises from 10'-0" to 17'-6", ranging from 1.73 lbs to 1.95 lbs. Above this latter rise the curves show a great increase, namely from 1.95 lbs. to 2.5 lbs for a 20'-0" rise. This may readily be explained, the size of the rafter being 4 lbs. up to 17'-6" rise, and above that point suddenly increasing to 5¼ lbs.

The weight of the purlins per square foot of horizontal projection was found to increase uniformly, that is the curves for all rises with the exception of 22'-6" are exactly the same. It was

found, but for the exception noted, that for a spacing of 10'-0" a 5" 9¾ lbs. beam would suffice, and that for each 2'-6" increase in rise the size of the purlin increased one inch, or for a 12'-6" rise a 6"-12# lbs. beam was necessary, for a 15'-0" rise a 7"-15 lbs beam was required.

The weight of the truss per square foot of horizontal projection shows a decrease as the distance centre to centre of trusses increases. Considered on the whole this decrease is regular. It varies from .9 lbs. to 1.5 lbs. per square foot in the various cases, the distances on centres ranging from 10'-0" to 25'-0". This would show that, so far as the trusses alone are considered, the most economical spacing would be 25'-0" centres. Other things must be included, however, in the comparison for economy, such as the total weight of the steel work, which includes the weight of the truss, purlins and rafters. Taking all these into consideration it is found that the curves increase steadily with an increase of spacing, thus showing

directly the opposite of that shown in the diagram for weights of trusses alone. It is also shown by a study of diagrams and that a rise of 12'-6", or ¼ pitch, is the most economical, not only as regards the weight of trusses alone, but also as regards the total weight of the steel-work as well.

Although these curves are not smooth, regular ones, yet it will readily be seen that the average curves for each rise would be approximately parallel to the average curves for the other rises. When we consider the differences in weight per sq. ft. of horizontal projection for each rise in its changes of spacing from 10'-0" to 25'-0", it is found that the maximum difference is but .5 lbs, and that the average difference is but .33 lbs. We must come to the conclusion that although the curves on the whole do not appear as average ones, we may, nevertheless, consider them as such because of the uniform increase in size and weight of the sections used.

The diagrams show that the

formula for the weight of the trusses, namely that of Merriman and Jacoby, gives results far too high for economical designing. In no case does the actual weight equal the estimated weight by formula. A diagram has been made showing the comparison of percentages of the various cases considering the weight by formula as 100%

It had been hoped, in the beginning of this investigation, to be able to obtain such a quantity of data as would enable a formula for the weights of trusses to be deduced. It has been necessary to set aside this idea because the data at hand is of insufficient quantity to issue a formula applicable to all cases.

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